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Tropical Life:

A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

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International Rubber Exhibition, London, 1911.

THE Kolonial-Wirtschaftliches Komitee, of Berlin, have decided to award at the above exhibition their gold medal for the best method of extracting rubber from Manihot and Kickxia (*F. elastica*) rubbers.

We hoped to have included in this issue a block of the "Grenier Trophy," with particulars of the competition. The photograph, however, has not yet come to hand. The value of the trophy, which represents Victory standing on the world with a wreath of rubber leaves to crown the victor, cost nearly 50 guineas, we understand, and not 25 guineas as we spoke of in our November issue. As trophies go, therefore, the winner in this case, even valuing it at 50 guineas, will have the satisfaction of knowing that he has been awarded a prize as valuable as it is artistic.

The Export of Birdskins and Feathers from the Tropics for the Millinery Trade.

IN our last issue we mentioned, on page 10, the publication of Mr. C. F. Downham's book on the above trade.* In our August (1910) issue we called attention to a book† issued by our publishing department, dealing with the trade from the point of view of the centres of origin. This book was issued by our Editor to let the public know the other side of the question, instead of inundating the papers as his opponents have done, and are still doing, with letters, articles, and paragraphs asking for the trade to be stopped.

We hope that Mr. Downham's book will be more fairly treated by the Press on this side than our book was, judging by the press-cuttings received. For the most part, although an unusually large number of books were sent out for review, the Press refrained from doing more than merely acknowledging receipt. Unable to pick the book to pieces, or to deny it fairness and truthfulness, they preferred that the public should not know of its contents. This may be diplomacy, but it is not justice. All controversies have two sides, and we do not see why the arguments advanced by those in favour of continuing the export of birdskins and feathers from the Tropics, subject to precautions being taken to prevent the birds becoming too scarce, should not receive the same amount of publicity as is offered to those who want to kill the trade.

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* "The Feather Trade: The Case for the Defence." By C. F. Downham. Pp. 126, paper cover. Price 8d. net, post free. Chamber of Commerce, Oxford Court, London, E.C.

† "Aigrettes and Birdskins: The Truth about Their Collection and Export." By the EDITOR of TROPICAL LIFE. Cloth boards. Price 5s. net.

In case it is suggested that our book was not worthy of notice, we have the long reviews on it in the *Morning Post* and the *Daily Graphic* of London, as well as in the Indian and Colonial papers. The first paper says: "The case . . . is here set forth temperately and even conclusively. . . There is much force in the contention that really rare birds are in greater danger from the ornithologist and the collector than from the milliner. . . Surely the climax of absurdity is reached . . . which permits the bringing in of feathers for the more deadly equipment of a man's fishing tackle, while refusing to allow their being used for decorative purposes upon the headgear worn by his wife." The *Indian Field* said that "it was certainly time that we heard the trade point of view," whose opponents' statements "have not always been characterized by reason and sobriety."

We hope, therefore, that the Press generally over here will offer to Mr. Downham's book the same fair and open criticism (without which the most righteous cause cannot be justly won) that our book received in the Colonies, and by the two London papers mentioned on this side. The book opens with the *Times'* criticism, printed in 1903, in connection with the letter that our Editor published in their columns in defence of the trade.

A Tropical Agricultural College as a Memorial to King Edward VII.

OUR leading article last month has brought us a host of important letters from leading men interested in the Tropics. They all agree that such a college is necessary, the only differences in the opinions expressed being as to which centre should be chosen for the site. Some go so far as to say, and we by no means disagree with them, that one college is not enough, but that there ought to be several. To this we would only add that one college is better than none at all, and that it will be best to erect and endow one to practise upon, than to arrange for half a dozen at once (even supposing the money was there to do so), and then find that they had not been arranged upon the most advantageous lines. Others, so we gather from their letters, seem to suggest that the training we are anxious to secure for young men from this side is already obtainable at such centres as the Imperial Department of Agriculture, and some of our leading botanical stations. If this is so, we are pleased to hear the good news; at the same time we feel that, as we were ignorant of the fact, others must also be, and would therefore suggest that the public on this side be told about it in the leading dailies. At the same time particulars regarding fees, conditions, cost of living, &c., could also be given.

Copies of the Journal reached a large number of men interested in the development of the Tropics. In acknowledging one sent to H.M. King George, at Windsor, Sir Arthur Bigge wrote: "It has been laid before The King and I am commanded to thank you for same."

WE learn from the *Kew Bulletin* that Mr. F. C. McClellan, of Kew, has been appointed Director of Agriculture, Zanzibar, in succession to Mr. R. N. Lyne, appointed Director of Agriculture, Mozambique.

The Causes of the Backward State of Sugar Planting in Brazil.

FOR many years past the sugar industry in Brazil has made but little progress, and in the opinion of many high authorities only a radical reform both in the methods of cultivation and of extraction can enable the industry to develop.

According to the last Consular report (issued by Mr. Grant Wilson at Rio) it is calculated that the world's consumption and production has increased roughly during the last ten years by 500,000 metric tons a year, the increase being 40 per cent. in beet sugar and 60 per cent. in cane sugar, and yet in Brazil, one of the oldest sugar-producing countries, the production fourteen years back averaged some 250,000 tons a year and the 1909 crop, which is considered a large one, did not exceed 240,000 tons. It should be added, however, that quality has no place in these calculations and the quality of Brazilian sugar has undoubtedly improved.

The crop for the current year shows promise in most States from which reports are available. The value of sugar exports was: 1908, £305,597; 1909, £689,266. The relative price per kilo. was 1 reis or $\frac{1}{66}$ more in 1909 than in 1908.

On this crop, eighth in importance among Brazilian products, depends largely the prosperity of the North-Eastern States, especially Pernambuco, Alagoas, Sergipe, Parahyba and also the Campos district of Rio.

The backward state of the industry is explained by some authorities as due to the unscientific methods of cultivation and the consequent degeneration of the canes, while the sugar factories, though as a rule set up with modern machinery, suffer from a shortage of skilled labour and of expert management, so that there is much waste and the production is limited accordingly. The factories in most States complain that the supply of cane is insufficient; according to a report from Pernambuco, arrangements are being made for financing some large factories with foreign capital and for working them on more economic lines.

By a tax of 400 reis (6d.) per kilo. on imported sugar, which prohibits imports entirely, the Brazilian market is secured for the local producer. As an offset, his produce on being exported has usually to pay to the State an export tax, which varies according to the State, the average being 200 reis (3d.) per kilo. He is forced, however, to find a market for his sugar abroad, as the production in Brazil is greater than the consumption. His sugar is sold abroad at prices which, to him, are unremunerative, while he obtains his profit from the local consumer by prices which are raised not only by import duties, which keep out foreign competitors, but by artificially limiting the amount of sugar for local consumption.

The Sugar Trust, or Colligacao Brasileira, which limited the local supply of sugar in 1908, gradually dispersed, owing to lack of cohesion among its members and to their inability to control all the producers.

Undeterred by this failure, a fresh syndicate was formed in 1909 to control, by combined action among the producers, the Brazilian market and to raise prices by limiting the local supply. Similar combinations in Brazil have so far not been able to carry out their

programmes, and this syndicate is practically limited to producers in the State of Pernambuco, though growers in other States have arrangements among themselves as to the amount they must sell for export.

Buyers have in consequence, reduced their purchases as far as possible, and the manipulations of the trust have caused violent oscillations in prices. In London prices are sometimes only a third of those in Rio, although Rio is within easy reach of Campos, one of the finest sugar-producing districts in the world.

Much was written during the year of the state of the sugar industry in Brazil. Dr. Mendonca Guimaraes, a competent authority, reviewed somewhat severely in the *Jornal de Commercio*, the methods of preparing the sugar. After alluding to the high import duties, he points out that Brazilian sugar cannot compete with foreign sugar abroad advantageously owing to the Brazilian export duties, and that it is only by abolishing these that the sugar can enter foreign markets on normal lines and progress be made.

Rubber Growing in Bombay.*

Can Para Trees Withstand Drought?

The Government of Bombay recently passed an interesting resolution on the prospects of rubber cultivation in the Bombay forests, based for the most part on a report made by Mr. R. L. Proudlock last year on their experimental rubber plantations. From a perusal of this report, and of the views therein expressed by the various forest officials concerned, it is very evident that the rubber experiments so far conducted in the Bombay Presidency have been more or less of a failure. This want of success is attributed by Mr. Proudlock to the fact that the Government plantations have never had a fair chance, but, given proper attention to the elementary rules of planting, he thinks that rubber planting in certain localities of the Presidency would prove very successful.

The Government have decided to curtail expenditure on the admittedly less suitable plantations, and to continue the experiment on careful lines at Gersoppa, where the prospects of success are considered most hopeful. The intention is to select ten acres of the land already cleared and partly planted up at Gersoppa, plant it carefully with Pará, water the plants until they become independent, and spare no pains to ensure success. If these works are properly carried out under the charge of a competent supervisor, the experiment should at any rate result in some very valuable information being obtained.

The three chief rubber-yielding trees experimented with were the Brazilian Pará (*Hevea brasiliensis*), the Mexican Castilloa (*Castilloa elastica*) and the Ceará, which is also from Brazil (*Manihot glaziovii*). Of these the Castilloa has apparently no friends, while all admit that Ceará will practically grow anywhere. It is in connection with the third species, Pará (which in the opinion of the best authorities is the most important of the three, and which, so far, has been much the most popular among rubber planters) that the principal differences of opinion betwen Mr. Proudlock, who has had many years experience in growing rubber trees in varying conditions, and the Bombay Forest officials arose. The chief points at issue were as to whether the failure of the Pará plants on the Bombay Government experiment plantations was due to bad treatment, as Mr. Proudlock says, or whether it must be put down to unsuitability of climate.

Regarding the question of climate; in the area admitted to be most suitable to Pará cultivation, viz., the Gersoppa jungles, Mr. Proudlock considers the average rainfall and humidity sufficient for the growth of rubber, but admits the fact, that the rainfall not being evenly distributed over the different months of the year, is a drawback. Mr. Copleston, Forest Officer, on the strength, apparently, of a short visit to Ceylon rubber plantations at the instance of his Government, goes further, and considers a drought of six months insuperable to Pará rubber cultivation. Mr. Bell, Conservator of Forests, agrees with this view, and refers to the opinion expressed by Mr. Herbert Wright (formerly of Ceylon) that a six months' drought would be fatal to Pará cultivation. Mr. Wright was certainly a great authority on rubber five years ago, but he is rather out of date now, and in his tours in the East he has not, we believe, included Southern India. At any rate, what he said in this connection was only a surmise, whereas it is well known now that Pará rubber trees can withstand drought admirably, and excellent trees of this species may be seen growing over large areas of the Nilgiri and Shevaroy Hills,* and in parts of Mysore, which are subject to quite as long periods of drought as those experienced in Canara. In fact, we have heard it said that inasmuch as Pará trees grow a thicker bark in climates subject to drought, they should yield more latex, but we are not aware that this has yet been proved.

At low elevations and in a dry climate it would no doubt be advisable, if not indispensable, to take steps to conserve the moisture in the soil as far as possible by proper cultivation, but this does not appear to have been done at Gersoppa. As regards this question of drought, the following note to Mr. Proudlock's report appended by Mr. W. A. Talbot, lately Conservator of Forests, Bombay, is of interest: "A long-continued dry season might affect Pará rubber grown on poor soils, but over most of the area in the North Canara district suitable for rubber, the constantly humid atmosphere and a water-level near the surface of the ground effectually compensate for the absence of an evenly-distributed annual rainfall. As a proof of the above, ever-green forests, which cannot possibly exist in prolonged dry climatic conditions, grows in North Canara quite as luxuriantly as in Cochin, Travancore, Ceylon and Java, where there is no dry season to speak of." Mr. Bell, we notice, also resorts to the stock argument of the conservative forest officer—the danger to the water-supply of cutting down ever-green jungle and "denuding land which would require at least 100 years to recover." But rubber planting in the Canara jungles would have to become very popular before much impression could be made on its hundreds of square miles of jungle, or on the water-supply said to be dependent thereon; and in the

* Reprinted from the *Madras Mail*.

* The trees may flourish as trees, but still not yield latex.—Ed. *T. L.*

event of Mr. Bell's worst fears being realized it is hard to believe that forest land that had been felled would not, if left to itself, become covered with a jungle growth again in much less than 100 years in such a forcing climate.*

The recent experience of Bombay in this matter of the experimental cultivation of rubber seems to be very much what that of Madras was a few years ago. Thanks primarily to the foresight of Sir Clements Markham, a valuable experiment in the growing of "India rubber or caoutchouc-yielding trees" was inaugurated in Malabar rather over thirty years ago. Several Pará trees were planted out at Nilambur under the auspices of the forest officials, and they made such excellent growth for the first few years that the possibilities of rubber cultivation on the West Coast of India should have been proclaimed to the world at least twenty years ago. Instead of this, the trees were neglected and allowed to be overshadowed by teak and mahogany trees. Tapping operations were conducted in 1886-87 and again in 1895, and owing to the comparatively poor yield of rubber obtained by the forest people, who had had no experience in the work, the whole experiment was pronounced a financial failure. Some trees, however, survived at Nilambur, but it was not till 1903, when Mr. Proudlock was deputed by the Government of Madras to report on the rubber-yielding trees of this Presidency that it was established that the Nilambur trees yielded latex freely and of excellent quality. The mistake had been made before of trusting ignorant and unskilled forest officials —subordinates for the most part, since the seniors had other work to attend to—to work out a valuable and important experiment which was beyond the proper scope of their work. The result was the retarding of an industry that now bids fair to bring prosperity to whole districts on the West Coast. As far as we can see, there is no reason why Mr. Proudlock, whose opinion has been proved to be right as regards the suitability for Pará rubber cultivation of the belt of coastal country which lies between the sea and the foot of the Western Ghauts in the Madras Presidency, should not be equally correct as regards the similar possibilities of the forest country in the southern divisions of Bombay. The Government of Bombay are doing well at any rate to continue their experiments, and we can only hope that they will be carried on under the auspices of a specially-qualified officer, as recommended by Mr. Proudlock.

Castilloa in South India.

FROM NOTES BY MR. R. L. PROUDLOCK.

Formerly Curator of the Botanic Gardens at Ootacamund.

IF planted 15 by 15 ft. apart, or 193 to the acre, in rich, well-drained soil, and treated properly, I consider that the climatic conditions and soil in the Nilambur Valley, especially in the Mois valleys, at the base of, and on the adjacent mountains, up to 3,000 ft. elevation, are favourable for the successful growth and for the production of rubber by this species.

On January 25th, 1903, there were twenty fairly healthy-looking Castilloa trees which I estimated to be about 30 to 35 ft. in height; these were probably part of the 192 plants received from Ceylon on behalf of the Government, at intervals from the beginning of April, 1883, to September, 1885, but a parcel of seed seems to have been introduced prior to this, for in March, 1882, Mr. T. J. Ferguson, of Messrs. Hinde and Co., Plantation House, Calicut, had raised 140 plants from a supply of seed that he had received. Eighteen out of the twenty trees referred to were rather heavily shaded by a species of ficus and a "rain tree" (*Pithecolobium saman*), *i.e.*, they were growing between these two large trees. Tree No. 1 was 45 ft. from No. 2; while the remaining nineteen trees were found to be standing at an average distance of 10·9 ft. apart. Tree No. 1 was measured by me on January 21st, 1908, and was found to be 50 ft. 10 in. in height, and 3 ft. 5¼ in. in girth at 4 ft. from the ground. This is the best tree, and had, at that time, a good shaped crown. In January, 1903, this tree measured 3 ft. 0½ in. at 4 ft. from the ground, and the average growth of the twenty trees worked out at about 21¼ in.

The earliest notice I have of Castilloa in this neighbourhood is of four plants received in June, 1879, which were, in all probability, planted and grown in a nursery at Nilambur. One of these must have died, for we find it recorded in paragraph 112 of the Forest Administration Report for 1883-84, and also in paragraph 201 of that for 1884-85, that only three were planted in June, 1880. Besides these three, rooted cuttings were received at Nilambur from Ceylon in August, 1882. Of these seven plants six were alive in 1885, the smallest one then being 4½ ft., and the largest 26 ft. in height. In 1884 these six trees measured as follows:—

Date Planted		Height Ft.	Girth at base In.	Girth 5 ft. up In.
June, 1880	No. 1	10½	9	6
	,, 2	19	16¾	13
	,, 3	19½	19½	16
August, 1882	,, 4	5	5	—
	,, 5	3½	3½	—
The Rooted Cuttings	,, 6	6	6	—

In 1892-93 one of the trees was entirely barked by a borer and died. No particular mention has been made of the remaining ones (five) beyond saying that they were doing well.

Elsewhere from notes I see that in February, 1882, two Castilloa plants were received from the Peradeniya Gardens, Ceylon. Twelve plants were propagated from cuttings taken from these. At that time it was considered likely that many localities in the Wynaad and on the slopes of the hills would be found suitable for Castilloa. By May, 1882, the gardens at Burliar, on the Coonoor Ghát of the Nilgiris, at an elevation of 2,400 ft. above sea-level, contained the two plants above-mentioned, and fourteen small plants raised from their cuttings. During the next three years some fifty plants were distributed outside the gardens. In 1884-85 plants were propagated at Calicut and Ootacamund. In 1885-86 it was reported that the plants at Calicut, a little above sea-level, were growing well, whilst other varieties were a failure either because they would not yield or because the proper method of tapping them had not been resorted to. In 1887-88 the plants of Burliar gardens were growing vigorously and flowering and seeding freely. The largest tree there, in 1890-91, measured 49 ft. high and 36 in. in girth, and was then described as fruiting freely, with seedlings springing up around it in numbers

* Or wide belts could be left, as recommended by us at Brussels.

every year. In 1893-94 some of the twelve-year-old trees were tapped with such disappointing results that it was proposed to obtain the services of an expert tapper from Assam. In 1902-03 the trees were manured experimentally in order to try and ascertain if their yield of rubber could be increased thereby.* In 1903-04 there was a good demand for Castilloa seed. In 1905 the trees of Burliar were thinned out, and the report of that year (serial No. 124) on p. 31 gives particulars of the measurements of the trees, together with remarks regarding the influence of irrigation on the flow of latex. The 1905-07 report shows that promising yields were obtained from the Castilloa trees as well as from the Pará and Ceará, and again in 1907-08 (p. 39) the report speaks well of the trees planted in September, 1898, says they were growing well, and gives their measurements.

Tapping Funtumia on the Gold Coast.

THE NATIVE SYSTEM CONSIDERED TO GIVE THE BEST RESULTS.

As promised in our December issue (p. 232), we are now able to include particulars of the methods employed when tapping Funtumia trees, as published in the Government Report of the Gold Coast, for 1909.

It will be remembered that there were some 12,800 trees planted in 1902, with an average girth of 13 ft. at 3 ft. from the base. The tapping experiments were carried out, in the latter part of 1909, on 75 trees, divided into 5 sections of 15 trees each. The following methods of tapping were employed:—

In the first four blocks the trees were tapped up to a height of 6 ft., seven tappings being made at intervals of ten days. Block V. was tapped only once, but in this case the tapping was extended up to 15 ft. above the ground. In each case a different method was adopted, viz.: (1) The herring-bone system; (2) Vertical system; (3) Half herring-bone; (4) Full herring-bone; (5) The native system, and the following results were obtained:—

Block I. (Herring-bone System).—15 trees, average girth, 3 ft. from the ground, 18½ in. At first, side cuts were made at intervals of 12 in. on each side of a vertical cut, and subsequently cuts were made between these, so that about 1½ in. of bark were left intact between each tapping. Total weight of dry rubber obtained from 7 tappings: 12·10 oz., or average yield per tree, ·807 oz.

Block II. (Vertical System).—Vertical parallel cuts made at intervals of 1½ in.; average girth of trees 19 in. Total weight of dry rubber from 7 tappings: 14·34 oz., or ·956 oz. per tree.

Block II. (Half Herring-bone System).—Half of each tree was tapped. Vertical cut first made, then side cuts at intervals of 9 in., subsequent cuts 1 in. below the previous cut. Average girth of the trees 18¼ in. Total weight of rubber obtained from 7 tappings: 9·17 oz., or an average of ·611 oz. per tree.

Block IV. (Full Herring-bone System).—The whole circumference of the tree was tapped. The vertical cut first made, then side cuts at intervals of 9 in. on both sides of vertical cut, subsequent tapping at intervals of 1 in. below previous tapping. This block gave the best result, although even here the yield cannot be considered satisfactory. Total yield of rubber from 7 tappings: 20·45 oz., or 1·36 oz. per tree.

Block V. (Native System).—This experiment was made in order to compare the native methods, viz., to tap high up in the tree, with those already described. Fifteen trees, of an average girth of 18½ in., were therefore tapped once, to a height of 15 ft., on the full herring-bone system, and the yield amounted to 1·34 oz. per tree, or only ·02 behind that obtained from Block IV., and as the working expenses incurred by this, the native method, are considerably less, it must be held to give the best results.

In our book, now in the press, on Rubber Estate Management,* we give rather fuller particulars about the different methods used than it is possible to do here.

The Propagation of Ceará Rubber.

KEW† summarizes the pros and cons of Ceará as follows:—

(1) The plant is readily propagated both from seeds and cuttings. Seeds are abundantly produced in almost every part of the world where the plant has been introduced. They may be gathered from plants when only three to five years old. Therefore there is the great advantage that a large area could be planted within a comparatively short period. Sowing the seeds in the position where they are to grow permanently is universally adopted in Brazil. It is possible, if adopted elsewhere, this plan would greatly reduce the cost of establishing plantations.

(2) The Ceará rubber plant is very hardy, a fast grower, free from insect and fungoid attacks, requires little or no attention when once established, and thrives in poor, dry and rocky soils, unsuited to almost any other crop. It is evident, however, that the yield of a few trees cannot be remunerative and only large areas can hope to make the industry a paying one.

(3) It produces a good class rubber, second only, when well prepared, to the best Pará rubber. For this there is a steady and continuous demand. The yield per tree is apparently small, but a return is obtained earlier than from any other rubber plant. With thick planting and judicious thinning as the trees grow up it may be possible to increase the yield hitherto recorded; whilst with skilful treatment the permanent trees may be tapped twice yearly, and last in a productive state for fifteen to twenty years.

(4) In spite, therefore, of the apparent want of success which so far has attended experiments with Ceará rubber plants in Ceylon and other countries, the increasing importance of rubber as an article in

* In previous issues of TROPICAL LIFE we show that this can be achieved, see March (1910), p. 53, and May (1910), p. 96.

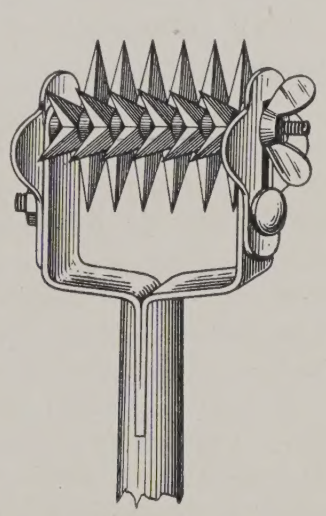
* "Soil and Plant Sanitation on Cacao and Rubber Estates," by the Editor of TROPICAL LIFE. Price 10s. net. London: TROPICAL LIFE Publishing Department, 83-91, Great Titchfield Street, Oxford Street, London, W.

† Kew *Bulletin of Miscellaneous Information.* Selected papers. Additional Series VII. Rubber—No. III. Price 2s. post free. TROPICAL LIFE Publishing Department.

large demand in all civilized countries at good prices, suggests a reconsideration of the merits of this interesting plant. In many of our Colonies possessing a dry climate and a poor, stony soil, it is possible that large areas could be profitably occupied with Ceará rubber trees, so grown as to provide annual crops for tapping.

Manihot glaziovii, by the way, is derived from Dr. Glaziou, who sent specimens of this variety to Kew from Rio.

One of the great drawbacks to Ceará in Ceylon and other centres where pricking must be resorted to, in order to extract the latex, has been the absence of a satisfactory multiple pricker. To meet this need we have designed one as per accompanying sketch, which we believe, judging by our conversations with Ceará men at the 1908 Rubber Exhibition, will go some way



Multiple Pricking Tapper, designed by the Editor of T. L. for Ceará Rubber Trees.

to help in the matter. The illustration shows a pricker with six rowels, but they can be made to carry as many rowels as desired. In that case extra dummies or washers are provided for screwing in the haft, should it be necessary to reduce, say, a 12-rowel tapper to six only. Regulators are provided, and can be moved up and down to prevent the prickers penetrating too far into the bark. The block shown was drawn from the first rough hand-made model, and actual tappers for export will be much neater and lighter, but we publish this illustration as we are anxious to hear our Ceará friends' opinion—complimentary or otherwise—on the tool before making up a large number.

International Association of Tropical Agriculture and Colonial Development.

FORMATION OF A BRITISH SECTION.

WE are glad to be able to report that a British section of the International Association of Tropical Agriculture and Colonial Development, which was founded at the close of the first International Congress of Tropical Agriculture held in Paris in 1905, when our Editor was elected one of the founder-members, has now been established in London, where it will be responsible for the organization of the Congress in 1912.

Since the first Congress in 1905 at Paris, we have repeatedly called attention to the good work being done by the Association in the promotion of the scientific and practical study of all questions connected with tropical agriculture and the development and utilization of the natural resources of the Colonies. The President of the Association, as stated in our June issue, is Professor Wyndham Dunstan, LL.D., F.R.S., Director of the Imperial Institute, who was elected at the close of the International Congress held in Brussels in May, 1910. The Association has its headquarters in Paris and is governed by an International Board, from which an Executive Committee of from five to seven administrators is selected.

The work of the Association is to promote investigations into questions of special importance to tropical agriculture, to publish the results of these inquiries, and to organize International Congresses for the discussion of the problems of tropical agriculture and Colonial development. Two Congresses have been held already and it is proposed to hold the third Congress in London in May, 1912.

The work of the Association is not only of interest to Departments of Agriculture and Forestry but also to planters and to merchants and manufacturers who are concerned with tropical and colonial raw materials, and it is hoped that all those interested in these important subjects throughout the Empire will join the British Section of the International Association.

The annual subscription for members of the British Section of the International Association is £1, payable on January 1st in each year.

Members of the British Section will have the privilege of taking part in the London Congress without further special payment. They will also receive all the publications of the International Association. In addition, the quarterly *Bulletin of the Imperial Institute* will be issued to them free of charge. A reading and writing room will be reserved at the Imperial Institute for the use of members of the section when in London, and members will also be entitled to make use of the general library and reading-rooms of the Imperial Institute.

Subscriptions may be paid by crossed cheque or money order, payable to the Secretary, International Association of Tropical Agriculture and Colonial Development, British Section, and, in the case of money orders, should be drawn on the General Post Office, London.

Letters and subscriptions should be addressed to "The Secretary, British Section, International Association of Tropical Agriculture and Colonial Development, Imperial Institute, London, S.W." Further particulars will appear month by month in our columns for the information of our subscribers.

The Drying of Coprah.

WE are glad to see that, at more than one producing centre, it is coming to be recognized that if the owners of coco-nut groves wish to obtain the full benefits of present high prices for their kernels and oil, they must take more care in the drying. Probably mechanical methods for doing so will have to be entirely resorted to, not only to secure a cleaner and more attractive sample to look at, but to prevent rancidity setting in, which completely spoils any chance of the produce being classified as "fine."

In a short paper read by Mr. George B. Hunter at

a meeting of the Trinidad Agricultural Society in December last,* that gentleman points out the large number of samples of coco-nut oil or coco-nut butter which, on examination, prove to be unfit for human consumption on account of their being rancid. Whether the oil has been extracted by machinery (and the bulk is, of course) or by other means makes no difference: the cause comes from the state of the oil brought about in the drying, or at any rate in the treatment of the kernels before going into the press. The rancidity, urges Mr. Hunter with emphasis, "is entirely due to the preparation of the green meat or coprah, from which the oil is extracted. The purpose of its preparation or drying, before being 'pressed,' is solely to evaporate the water it contains and to open the oil cells. When this preparation is effected by means of the sun, everyone will admit that it is good green coprah just spoiled. . . . Drying, when done by artificial means, produces better-prepared coprah, which facilitates the extraction of oil." To produce coprah without the defects that cause the oil or butter to become rancid is by no means easy, and Mr. Hunter claims that the surest way of doing so, perhaps the only way on a commercial scale, is by means of the vacuum dryer, and even then, he adds, to be perfect, it requires a specially-constructed apparatus to "rock" the trays,† and a temperature not exceeding 130° F. Mr. Hunter claims that the only reliably perfect oil is that made by hand. "Fry anything," he tells us, "with hand-made oil, and see if it tastes disagreeable in any way; then try a similar experiment with oil made by machinery," and notice the difference. Even if the lecturer's contention was entirely correct, it would of course be impossible to make coco-nut oil or butter by hand; but we have no doubt that if fully-matured nuts only are used and the "meat" is kept clean, and dried mechanically, as Mr. Hunter suggests, by an oscillating mechanical dryer, either under vacuum or not, then the resulting oil or butter will be entirely satisfactory.

Java, we understand, is waking up to the serious financial losses incurred through carelessness in preparation, and the indiscriminate plucking of immature nuts, and the Germans in New Guinea are trying to turn out a less discoloured article free from mould and rancidity.

Dr. Willis included in the *Tropical Agriculturist* of November last the following abstract of some notes on the drying of coprah in the *Tropenpflanzer*, of Berlin (June, 1910, p. 288):—

"A much lower price is paid for coprah that is discoloured or smells of smoke, as it cannot then be used for making butter without considerable expense.

"The kernel of the freshly-opened nut is wet with coco-nut milk, which is a fruitful cause of mould and of darker coloration. The first stage of drying, therefore, requires a fairly high temperature, say 60°-70° C. (130°-158° F.) or higher. When the outer moisture has disappeared and the flesh is a little dried the temperature may be lowered to 50° (122° F.). but not below, and this temperature must be maintained till the coprah is at least half dry. To remove the last moisture, the temperature must be once more raised, and the coprah must be cooled in an airy room. Coprah drying should be undertaken immediately after the opening of the nuts, and should be finished in 24 hours.

"For such treatment sun heat is unsatisfactory, and artificial heat is recommended. This also, we may remark, leads to much more uniformity in the sample, a very desirable result."

To ensure an output of the best coprah only of good reliable, even quality, "Cutting nuts from the trees with a long pole is not recommended, as many unripe ones are sure to be gathered.

"Experiments in New Guinea show that 4,438 nuts gave a ton of coprah. Freshly-cut kernels gave 62.7 per cent. of dry coprah.

"Dry coco-nut shells form the best fuel."

The Value of Nitrogen to Plant Life.

"AMONG fertilizing constituents, nitrogen must be given the first place. Not only is combined nitrogen much more expensive than either potash or phosphoric acid, but as a fertilizer it seems to have a much more direct and immediate action upon a plant than the other two substances (phosphoric acid and potash), which are at bottom equally indispensable. Nitrogen pushes on the first vegetative development of the plant, promotes its growth in fact, thus enabling it to search the ground more thoroughly for phosphoric acid and potash. Sulphate of ammonia should not be used on light sands, nor on peaty and other soils which have any tendency to get sour."—Mr. A. D. Hall, in his book on "The Feeding of Crops and Stocks."

Up at Liverpool the rubber market has been firm and advancing during the week (ending February 10th), with a good business done. Sales include: Hard fine March-April 5s. 6d. to 6s. 3d. to 6s. 0½d. to 5s. 11d., April-May 5s. 9d. to 6s. 3½d. to 6s. 1½d. to 5s. 11½d., May-June 6s. 4d., Island fine spot 5s. 3d., Peruvian fine spot 5s. 5d., scrappy negroheads 4s. 2d. to 4s. 4d., and Caucho ball 4s. 1½d. to 4s. 3d. per lb. There has been a good demand for medium Brazilian grades, and the transactions include Ceará scrap at 3s. 2d. to 3s. 4d., Assare scrap 2s. 7d. to 2s. 11d., Ceará negroheads 3s. 7d. to 3s. 10d., Manicoba 3s. 3d. to 4s. 3d., and Mangabeira 2s. 6d. to 2s. 9d. per lb. A large business has been done in African during the week, chiefly in Gold Coast lump at a further advance, and the market closes steady at some decline for this description. The sales reported are about 185 tons, including Rio Nunez red niggers 4s. 9d. to 4s. 10½d., Conakry red niggers 4s. 3½d. to 4s. 10½d., Lahou niggers 3s. 2d. to 3s. 9d., Assinee red niggers 4s. 8d. to 4s. 9½d., Gambia twists 3s. 2d. to 3s. 4d., Bissao buttons 2s. 10d., Hausa cake 3s. 3d. to 3s. 7d., Lahou cake 3s. 2d. to 3s. 5d., Batanga ball 2s. 6d., Manoh roots 2s. 8d., Accra paste 1s. 6d. to 1s. 5½d., selected Gold and/or Ivory Coast lump 2s. to 2s. 4d. to 2s. 1¾d., ditto rejections 1s. 11d. to 2s. 0½d., and ditto pasty rejections at 1s. 8d. per lb.

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* *Proceedings of the Trinidad Agricultural Society*, vol. x., part 12 (December) p. 515.

† Surely the rotary dryer worked *in vacuo*, made by Messrs. David Bridge and Co., Ltd., would do here, for though Mr. Hunter suggests that the coprah should not shift, we do not find that it can hurt if it does. On the contrary, without some movement we do not think an even drying can be assured.

Rubber in Southern India.

WE are glad to see that the planters and landowners in Southern India show signs of making more strenuous efforts to call attention to the advantages that that portion of the Empire has to offer as a rubber-producing centre. A year ago when others were booming, first Ceylon, and then Malaya and Java, it was a pity that those owning property in Southern India were not equally enterprising and anxious to make the most of their lands in the same way, for whatever success and money has been made out of the rubber boom elsewhere was only obtained on account of the confidence of the promoters in what they had to sell. Why Southern India did not show equal confidence in her chances is hard to say. We never did believe in hiding one's light under a bushel, no one thinks any better of you for doing so, and though sometimes the flicker of the farthing dip has been magnified into a resemblance of the arc-lamp, one cannot help feeling a greater admiration for those who make the most of their opportunities. We believe Southern India has many opportunities, and hope that she will make the most of them, as from all we have ever heard of the climatic conditions of that centre Ceará rubber, cotton, fibres, and many other products could be produced, with or without the aid of irrigation, with marked success.

Before leaving Ootacamund for Burma, Mr. R. L. Proudlock (see *Our Friend* for January, 1908), issued two very useful brochures on the Nilgiris, and the part they could play in the production of economic products if given a chance. His leaflet, referring to the various reports and notices that had been written relating to the subject of rubber in the annual reports of the Botanic Department of the Nilgiris, will be found very useful, since it includes the then Curator's (Mr. A. Jameson) report issued in 1877, and only ends with Mr. Proudlock's notices published in 1907-08. Any one thinking of planting rubber in the South of India can see at a glance, by consulting this list, which report will give him the fullest information on the particular points in which he is interested. It also contains in itself useful items of information such as: 1879-80, "Ceará rubber doing well at Burliar; best tree 17 ft. in height, flowered in May, 1880." Elsewhere we are told that these plants, four in number, were received in October, 1878, from Colonel Beddome, and planted in Burliar Garden, which is situated on the Coonoor Ghát of the Nilgiri Hills, some 2,400 ft. above sea-level. Two Ceará plants, planted in the Kalhatte Gardens, 5,500 ft. above sea-level, on the Sigur Ghát, about 6 miles north of Ootacamund, in July, 1879, were doing well in 1880-81, but were more dwarfed and more branched than those at the Burliar Garden. The best tree at Kalhatti in 1880-81 was 16½ ft. high and 10 in. in girth, at 1 foot from the ground. In the end these trees did best, because we are told in the 1881-82 report that two of the Burliar trees, after being completely established, were broken over by the gale in November, 1881, at about 15 ft. from the ground, and the seed lost, whereas the Kalkatty trees, though more dwarfed, continued to grow well, with a greater thickness of stem in proportion to their height, and with thicker and more abundant latex than was obtained from trees of the same age *growing at a lower elevation.*

From the Burliar trees, broken by the gale, cuttings were successfully propagated from the branches. The pamphlet, of 19 pages, gives a regular diary of all the rubber-planted, Ceará, Castilloa, Pará, and even Funtumia, and the progress they made. Full particulars, if needed, would, of course, necessitate a reference to the original reports, but as number, year, and even the page is given, this could be done without much difficulty.

Madrasi Ryots to Use Iron-roller Sugar-cane Mills.

WHAT THE LOCAL AGRICULTURAL ASSOCIATIONS ARE DOING.

WE have on several occasions urged the use of modern sugar machinery, either in central factories or on individual estates in the chief sugar-producing centres of India, as the excessive loss in the output of sugar, possibly 50 per cent., through lack of the proper machinery, would more than recoup the cost of the machinery, expensive as this may be. In August, 1907, in speaking of the sugar industry in Mysore, we showed, quoting Dr. Lehmann, the Agricultural Chemist to the Government of Mysore, that 20 per cent. is sometimes lost through over-fermentation, and that, as a rule, 13 per cent. of the total price was lost by underliming; whilst the percentage of juice left in the cane varied from 20 to 38 per cent., the average working out at 26 per cent. The total loss to India would at this rate exceed the whole of the Cuban crop this year (1,800,000 tons), and is therefore well worth trying to save, as, at the present price of sugar, the gain to the India ryot would be enormous, and the Indian agriculturist needs the money badly enough. We hope, therefore, that those responsible for the "Awakening of India" to more up-to-date methods, will persevere in their efforts to get central factories introduced, and to persuade the ryot to give up extracting his juice by the present primitive methods.

In the printed proceedings of the eighteenth meeting of the Central Agricultural Committee of Madras, we notice that attempts are being made by the Ganjam District Agricultural Association (Madras) to popularize the use of iron-roller mills in place of the country wooden mills for crushing sugar-cane, and it is hoped that, by continual demonstrations, the cane-growers of the district, who are already taking keenly to the Mauritius variety, will be induced to adopt the iron mill, which can, of course, extract a larger quantity of juice than when wooden rollers are used. The Director of Agriculture considers that the Mauritius cane could be grown on a large scale in the Malabar district. There is an impression that sugar-cane in this centre is deficient in sucrose and good jaggery cannot be made from it. In South Canara the cane-growers fully appreciate the superiority of this, the Mauritius, variety over their local variety, which contains less saccharine matter, and is more liable to be attacked by jackals during its growth. The Agricultural Association at South Canara has also purchased a three-roller iron cane mill for demonstration purposes. It is working side by side with the old wooden roller mill. On seeing the advantages of the metal rollers, it is hoped that the natives will adopt them.

These Associations generally seem doing all they can to place agriculture on an improved basis. Caravonica and Cambodia cotton are being planted in several new centres, especially the former, whilst improved ploughs are being introduced, and fresh varieties of crops already planted are recommended, or entirely new ones experimented with, and if found suitable, given out for reproduction. With such a policy there should be a change for the better in the lot of the Madrasi ryot and a marked advance in agricultural methods in India, and we wish the movement every success.

Manihot Rubber Trees.

No. VIII.

THEIR CULTIVATION ON THE NILGIRIS, S. INDIA.

A PLANTER, who signs himself "Hopeful," writes as follows from the Nilgiris to the *Madras Mail*:—

"Sufficient time has now lapsed on the Nilgiris since planters started experimenting with the three new varieties of the Manihot, for at least one of these planters to state from actual experience, whether he thinks these rubbers will prove the salvation of the planter, who owns land at an elevation at which it is absolutely certain no rubbers such as Pará, Castilloa, &c., will grow. At the start no one could tell, not even the exporter of the seed from Bahia, the seller in Ceylon, or the purchasing planter, at what extreme height these Manihots would be a success. The general idea was that these varieties would grow at higher altitudes than the species above-mentioned, and consequently allow planters at these altitudes to participate in the great boom! It is only natural that planters whose land elevations prohibited rubber planting anxiously wanted a species that would really thrive in more temperate zones, and like the proverbial drowning man and the straw, when the Manihot arrived, with even the suspicion of a likelihood of its being grown profitably, at 5,000 ft. above sea-level, there was a great rush to try it.

"As I will later on show, I do not think there is the slightest doubt that these rubbers will do, and do well, in sheltered blocks, at even 5,500 ft. elevation. Everything, however, must have its drawbacks or this disappointing old world would be too easy to live in. There certainly would be no booms of any kind. The great drawback, and one which has well-nigh disgusted and compelled most experimenters to stop and abandon all hope as to its being even moderately cultivated, is the utter impossibility of germinating even 5 per cent. of the seed! With the utmost care—*i.e.*, well-regulated heat, good drainage, the right amount of watering, &c.—from 10,000 seed (90 per cent. guaranteed sound) I have only managed to raise 250 plants, or 2½ per cent. The remaining ungerminated seed, if still carefully nursed, may distribute its germination over a twelvemonth; but, at this rate, when would any appreciable area come into yielding? I think men at high elevations are far from wise to let this troublesome germination* damp their ardour, or indeed make them "chuck it," as some seem inclined to do. Knowing that I have got hold of a good thing, I also know what my 2½ per cent. of plants will yield in three years, in the way of cuttings; these are easy to strike, and each three-year-old tree (judging by the growth, which I shall presently describe, of one-year-old trees) will at least yield 20 cuttings, at a modest estimate, so that every 250 plants a man owns at the present moment will, in three years, give him 5,000 cuttings and so on, *ad lib*. Thank Heaven that, with drawbacks, there is the "law of compensation" also.

"As this is a subject which must interest a great number I will now give the experiences up to date of another planter and myself, who were absolutely the first to try the Dichotoma and Piauhyensis on these hills at a high elevation. We started by purchasing a few Dichotoma plants from the Horticultural Gardens, Madras; this was during May-June, 1909. When planted on my friend's estate at an elevation of 5,400 ft., and on my estate at 5,750 ft., the average height of the plants was 1 ft. To-day (exactly a year after) these trees average 6 ft., and some stand at 7 and 8 ft. All are branching beautifully, and what is most encouraging, many have a girth of 7 in. at the collar. These plants have stood the first winter well, frost lying in the valley not 500 yards away! I consider that my friend's elevation is the maximum height at which these rubbers will be quite satisfactory, as my Dichotoma, which is now 6 ft., is not nearly as fine as his in girth measurement, in consequence of my 350 ft. higher elevation. We have kept careful notes, and made searching inquiries from men who are growing these at elevations lower than 5,000 ft., and from all the replies we have had and from what we have seen, Peradenyia in Ceylon not excepted, we have come to the conclusion that the Dichotoma will at anything below 5,000 ft. grow spindly and tall, and from 5,000 ft. up to 5,500 ft. thick, robust and sturdy, provided always this variety is grown in well-sheltered hollows. A Mysore planter was disgusted with the growth of his Dichotoma at 3,000 ft. after seeing my friend's at 5,400 not only as regards girth, but also in height!

"The above notes concern the plants bought at the Horticultural Gardens, Madras. Subsequently my friend got 2,000 seeds from London, of which he raised 25 per cent. plants. These he planted in the field six months later and all are now growing vigorously in a one acre plot. This plot was visited by our Scientific Officer a few days ago and that gentleman, who has seen the growth of the Dichotoma in various localities and at various elevations, was astonished, as well as hugely delighted, at the growth and robustness of both Dichotoma and Piauhyensis on my friend's experimental acre. The rainfall, I might mention, is only 50 or 53 in. yearly. It will yet pay those who think they have thrown away rupees on non-germinating seed to carefully conserve all plants they have managed to raise, no matter how few, for in a short time they can multiply each plant many times over with cuttings."

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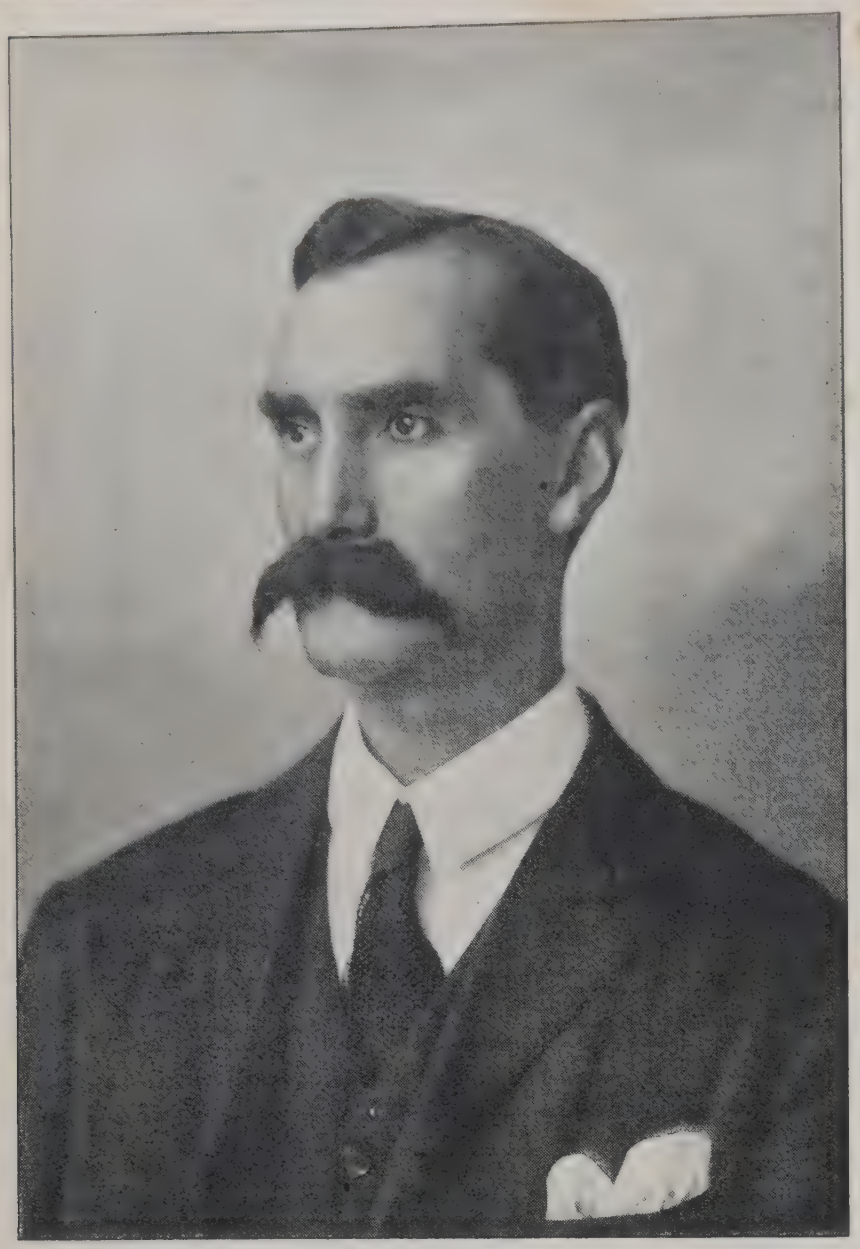
* There are several suggestions for overcoming the trouble with the germination of *M. glaziovii* seeds, some of which are given in the section on Ceará Cultivation we are including in our book on "Rubber and Cacao Cultivation," price 10s. post free, TROPICAL LIFE Publishing Department.



"Tropical Life" Friend.—No. 68.

Mr. W. MUNRO CUNNINGHAM,

Head of the Agricultural Department, Bahamas.

"OUR FRIEND," this month, was, I believe, the first to successfully grow, and cure, Sumatra wrapper tobacco under cheese-cloth shade in the West Indies. This he did in Jamaica, and, since then, that island has made great progress with its tobacco and in the exporting of cigars worthy of the attention of connoisseurs, until to-day tobacco-culture and cigar-making are established industries out there.

From reports and letters received from the Bahamas, these islands, although they do not loom as prominently in the eye of the public as they might do, still offer an excellent school or experimental ground for those desirous of planting-up tropical or sub-tropical areas, especially with cotton, fibres, tobacco, and pineapple cultivation. We cannot help feeling that small and unimportant as these fertile islands may seem to be on the map, it would well repay many English families with a little capital and plenty of energy to go there and cultivate mixed plantations in a pleasant, healthy climate, according to their means, beginning with those crops that cost less to lay down and give quick returns, as onions, potatoes, tomatoes, and cotton; then, if they wish to do so, to go on to tobacco, rubber, and sisal. The American market is close by to take all these; whilst, should the industry assume importance, the Royal Mail, Scrutton's, or other lines, would call in for a cargo and run them across to the United Kingdom as fast as they can be grown, so as to arrive in the off seasons. Mr. Cunningham has made a special study of all these products, and, under his guidance, anyone who has acquired a little agricultural knowledge should find it fairly easy to make a start. From all I have heard of "Our Friend" they would find in him a staunch supporter, as he is most anxious to develop the industries and trade of the islands.

At present, Mr. Munro Cunningham, like a good many other people, is busily studying rubber. In the island he discovered an indigenous rubber-producing vine, the *Cryptostegia grandiflora*, which is evidently receiving attention on a commercial basis, as in his last letter "Our Friend" said: "I hope in a year or two that we shall be exporting the rubber to London, where samples from this vine already sent on ahead have been very favourably reported on as being a first-class rubber."

The Bahama planters are beginning to see the truth in Mr. Cunningham's contention that it would be worth their while to cultivate fine Havana cigar-leaf tobacco, on which their Superintendent is a recognized expert, and the island will soon be producing a fine grade of this leaf-tobacco in sufficient quantities to export. Other landowners have taken up sea island cotton cultivation, and some are making excellent progress under "Our Friend's" direction with their sisal fields.

As a proof as to how Mr. Cunningham's work is benefiting the colony, statistics show that, although last winter was the first one during which tomatoes were exported, this being a new industry, over 40,000 cases are reported to have been shipped to America, and this season they hope, if the weather is kind to them, to ship 150,000 cases. To be in a position to do such a thing in only two years shows the push and energy of the planters and the capability of their Head Agriculturist. With pineapples, "Our Friend" has just completed a very successful experiment with fertilizers, and has placed on the market a new formula, which he claims will give better results than any other fertilizer tried on scrubland in the Bahamas.

Mr. Cunningham has time, like others of his ilk, to publish a useful little bulletin, in which full particulars of the various industries he is pushing can be studied. These include rubber, cotton, tobacco, tomatoes, onions, ramie, pines, citrus fruit, sisal, &c., &c., all of which he has been carefully studying there during the last six years. Certainly such an island deserves every support, and we shortly hope to see its industries increase to warrant extending the botanic and experimental gardens, as the lessons to be learnt there would be of great use to other centres, where for climatic or other reasons, the botanic gardens cannot be used for so diverse a range of economic products, although great variations in the altitude of lands suitable for cultivation might enable many sub-tropical crops to be cultivated within their area.

We are afraid we have said in these rough notes more about the Bahamas than "Our Friend," but as he is so much a part and parcel of the island's agriculture, we feel that, in discussing the progress of the latter, we can best show the benefits bestowed on the island by its Curator of the Botanic Gardens.

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All **literary communications** should be addressed **to the Editor,** and accompanied by the necessary stamps for their return if not accepted.

3.—All **business communications and payments**, either for subscriptions or advertisements, should be sent **to the Publishers** of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is **Ten Shillings** per annum, may commence at any time, and is payable in advance.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed to the Manager of the Department.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

FEBRUARY, 1911.

The Need of Improved Methods of Cultivation for India and the Tropics.

WE are pleased to see that our esteemed contemporary, *The Indian Trade Journal*, continues its endeavours to raise the level of the agriculturists in India, realizing, as we have always done, that if the Indian ryot is to hold his own against the rapidly-improving methods being adopted elsewhere, they must improve their methods and obtain larger yields at less cost than they are doing at present.

In no less than five of their issues last year (April 7th, p. 6; May 26th, p. 206; July 28th, p. 91; August 25th, p. 196; and again on September 15th, p. 280) particulars are given of the best means of supplying improved agricultural implements to agriculturists in India. Makers of ploughs, chaff-cutters, winnowers, cultivators, reapers, pumps, threshing machines, rice and wheat machinery, spraying machines, &c., should carefully study these articles, as, with a little support to the planting papers and some patience with the natives, a good trade will eventually be worked up, even with the immutable Indian ryot. When that day comes, those who were in at the start run the best chance of being in at the finish.

The Indian Government is doing its best to assist in the movement. In the Punjab, for instance, the Agricultural Department receives from the Government a permanent advance of Rs. 4,000 (about £266) to be devoted to the introduction of agricultural implements to cultivators throughout the State. In a word, everything is being done by the Government and the semi-official Press to make the agriculturists buy the machinery; what surprises us is the meagre show of appreciation and response from the makers of such implements over here. We do not wonder that the Americans, who fill their home journals to overflowing with advertisements, get so much of the trade.* It may be a cheap trade at the start, but in all probability, as the buyers secure the benefits from their purchases, possibly by co-operation at the start, they will take to a better class of implement and then everyone will be in a hurry to serve them. We hope, however, that our readers, like ourselves, will come in at the start and so secure the pick of the trade.

We cannot get a single maize sheller to look at us as an advertising medium. Yet we move amongst the largest growers of maize in the Tropics.† The Agricultural Department in the Central Provinces has a permanent advance of Rs. 10,000 to push the use of improved implements, and to stock winnowers, ploughs, chain-pumps, sugar-cane mills, maize-shellers, and bullock gears, because no private firm offers to sell them. Small iron sugar-cane mills, we are told, are in some demand.

Since last June, 120 winnowing machines have been sold. In Sind there is a workshop which made, and, we presume, disposed of, 500 ploughs in eighteen months. A Belgium firm, however, sells about 200 ploughs a year, but no mention is made of an English one. In Bengal there is a budget grant of Rs. 15,000 (£1,000) devoted to the upkeep of the central seed and implement store, which distributes, among other items, sugar-cane mills and evaporating pans, as well as maize-hullers.

In Madras the work has been wholly confined to supplying implements. A small number of spray machines are stocked for sale to Khasi cultivators, together with grafting and pruning tools. The sprayers, by the way, are chiefly used for spraying potatoes in the Khasi hills. But we have not room to multiply the instances. We again maintain, however, as we have always done, that there is a genuine and steadily increasing demand for agricultural implements and sugar machinery in India, and the more that this demand is fostered and fed up, the better and more remunerative it will become. Although the trade needs patience and perseverance, as all new businesses do to work up, we hope some of our readers on this side who are interested in the implements stated will do their best to support the Indian Governments and *The Indian Trade Journal* in their efforts to improve agricultural methods on the one hand, and to create and develop a trade in the machinery and implements required to do so on the other. In doing this everyone will benefit.

A RECORD number of visitors were registered at the Royal Botanic Gardens, Kew, last year (1910), viz., 3,546,302, against 3,360,221 in 1909. The record for a single day was established on last Whit-Monday (May 16th) with 152,454 visitors, the total for the month being 679,734.

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* See also Mr. Consul Haldeman Dennison's report on the sugar machinery, implements, &c., suitable for India.

† The other day we were asked to recommend a dryer to treat 150 tons of maize a day in Nigeria.

By-Products on Cotton Estates.*

THE enormous increase of late years in the demand for vegetable oils and fats for human consumption and manufacturing purposes has almost revolutionized the industries which are, by courtesy, still known as the "olive oil" and "butter" trades.

Whilst the latter nowadays looks largely to cocoanuts for its raw material, the cotton fields appear most suitable for drawing upon to augment the world's demand for olive oil. In both cases it seems not unlikely that the imitation butter and oil, whilst being cheaper than the genuine article (certainly as it would have been if the supplies of the genuine articles had not been added to sufficiently to satisfy the demand), is even more nourishing, and the American authorities strongly recommend the use of cotton-seed oil for human consumption.† "It is a wholesome, palatable, nutritious, cooking, salad, and table oil," claims Dr. Harvey Wiley, Chief of the Bureau of Chemistry, U.S. Department of Agriculture. "Put it on your table, and give it to your children, and you will raise fleshy children, free from tubercular and scrofulous diseases." Dr. George Brown, ex-President of the Anti-Tuberculosis League of the United States. According to Professor Moore, of the Arkansas University, the digestibility of cotton-seed oil is nearly 5 per cent. better than that of olive oil, which, in its turn, is more digestible than the others. The percentages given by Professor Moore run as follows:—

Pure cotton-seed oil	93.37	per cent.
Olive oil	88.81	,,
Corn oil	86.47	,,
Peanut oil (or ground) ...	85.87	,,
Lard	73.88	,,
Beef suet	73.66	,,

These figures, however, apply only to the better grades of cotton-seed oil, and not to the cheaper and often much-advertised kinds. As Dr. Godsmark shows in his article, that, to obtain the fine grade cotton-seed oil just described the seeds have to be freed of every particle of dirt, and the "meats" from any and every source of contamination. The oil also obtained from this carefully-cleaned "meat" has to be filtered and refiltered through Fuller's earth to remove the palmatin or stearin it contains. After thorough filtration the oil is heated to a point not less than 300° F. (*i.e.*, 100 degrees hotter than boiling water), when superheated steam is passed through it, thoroughly cleansing it, so that no germs of decay or disease can exist in it. The oil is then drawn off into immense covered tanks and allowed to ripen, or mellow up, and settle.

In the face of these reports and the ever-increasing demand for more oils, our cotton-growing readers, as we suggested in a previous issue, will be well advised to see if they cannot, either individually, or by running a central factory, gain for themselves the profits that these fresh sources of income can yield from the by-products of their estates.

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* "By-Products on the Cotton Estate," TROPICAL LIFE, October, 1910, p. 195.

† See Dr. O. C. Godsmark in the *Cotton-seed Oil Magazine*, or the reprint in *The Indian Trade Journal*, p. 291, of September 15, 1910.

Mexico and the Labour Question.

By MR. D. BANKHARDT,

Owner and Editor of the *El Hacendado Mexicano*, published in Mexico.

THE article published in TROPICAL LIFE of November, 1910, under the headlines of "Barbarous Mexico," has drawn my attention to some more of the harm done by these gratuitous attacks by articles on Mexico.

The Yaqui Indians mentioned, belong to a tribe in Sonora, which would not submit to the laws of Mexico; they committed endless crimes, robbed properties, and jeopardized life. In similar cases, what would any other civilized nation do? Use force to compel submission where no other means were possible. That is what was done, and so as to separate the bad ones from those who accepted to submit to civilization, the Government sent the criminals to Yucatan, Campeche, Tabasco, and Veracruz, to work on plantations where labour was wanted; and the planters were willing to pay them the same as any other labourer. I myself have seen them on sugar plantations in Veracruz, and they are treated exactly the same as Mexicans, Negroes, Chinese, or Japanese, all of which are to be found as labourers in the various plantations in these different States. They are not sent to slavery or torture, and those who make such a statement prove that they know nothing about labour conditions in Mexico. The magazine in America published some so-called photos representing atrocities, said to have been seen, but most of these photos, and certainly the sensational ones, were drawings made up for the illustration of the articles and were not taken from Nature at all. All the false statements published in the magazine have been refuted by reputable citizens and officials, and published in the local papers here. I can only say, in conclusion, that all the statements made were simple concoctions, written to create a movement of pity for a certain labouring class in Mexico, where no pity is needed. Labouring classes are no worse off here than they are anywhere else, and the Yaquis, although taken in open rebellion against the Government of the country, were treated very leniently, the only restriction being that they must not return to the State of Sonora to excite the old disorders, but have to remain in the Southern and South-Eastern States, and work like any other labourer. Your friend, who, according to you, was commissioned to come to Mexico and report on a property, and who would not have anything to do with rubber in Mexico owing to what was published in the magazine, is the first of the kind I have heard of, but I do know several highly-educated Englishmen who have come out quite recently to Mexico and reported on properties, with the result that business has followed to the benefit of all concerned; one of these, as recently as August last, wrote on the subject of "Mexico and the Labour Question," and extracts from this article appeared in the *Financial Times* of London, about the middle of that month.

Dr. David Thomatis, the Caravonica expert, also writes us regarding the above, and his letter confirms all that Mr. Bankhardt urges in defence of the Mexican authorities. Want of space alone prevents us from including both articles.

The Demand for Ploughs and Maize-hullers and Irrigation Plant in Portuguese East Africa.

ACCORDING to Mr. M. T. Dawe, the new Director of Agriculture to the Cia da Moçambique, who recently visited the farming districts of Chimoio and Manica, there should be a good demand for ploughs and irrigation plant out there. In the Chimoio district, particularly around Mandegos, the country does not lend itself to irrigation, hence dry-farming (needing ploughs) is almost exclusively practised. In Manica, on the other hand, water is abundant in the high lands near Macequece, and most of the farms are supplied with irrigation water from the hills. The principal crop is maize, and in the Revue Valley as many as three crops per year can be reaped. As the farmers become more wealthy, the demand for ploughs and improved agricultural machinery seems likely to further increase. What is also badly required are cheap stump pullers, as the stumps whilst costly to pull out, are serious impediments to cheap cultivation, especially when, as is often the case, it is carried on by hand. Labour-saving appliances of all kinds will become more and more in demand, as the shortest way to success is to be independent of the native labour, or as much so as possible.

Large areas of land, both in Chimoio and Manica, are suitable for steam ploughing, which Mr. Dawe recommends as the deeper furrows improve the crops. Not only would the steam ploughs also render the farmers less dependent on native labour, but there are a number of ways in which the engines could be utilized when not used for ploughing; these include transport, stump-pulling, driving maize-hullers, saw-mills, &c., all of which would save money to those buying or hiring the steam-ploughing plant, as well as giving better returns as a result of the improved cultivation. As the bulk of the farmers seem unlikely to be able to afford to buy steam ploughs outright, the Cia da Moçambique or others might, as Mr. Dawe suggests, import one or two ploughing and maize-hulling sets, and hire them out to the farmers, either for ploughing or the other purposes mentioned.

As we have already mentioned,* here as elsewhere there is an excellent demand for maize-hullers or shellers. A few portable power shellers, capable of shelling, winnowing, and grading the maize or mealies would be much appreciated. Makers of such machines, however, seem very loath to call attention to them. The style of plant needed is one to cost about £250 at Mozambique, capable of turning out 1,200 bags per day of ten hours. The grading attachment will be very useful, as it separates the larger grains from the smaller, which would enable the farmer to realize a higher price for his maize. The general use of power maize-shellers, urges Mr. Dawe, would effect an immense saving in labour and cheapen the production of maize very considerably.

We have always been believers in the territory administered by the Cia da Moçambique, and Mr. Dawe's report confirms our opinion of the fertility of the land, and that it would repay men with a little capital to cultivate. In order to attract settlers with the capital necessary for the proper development of the land, Mr. Dawe recommends the establishment of three specimen and sample museums and information bureaux, one in London, one in Lisbon, and one on the other side in Beira. At these centres could be exhibited specimens of the mineral and vegetable products of the country, of its game and avi-fauna, &c. Planters and merchants alike could see and test the maize, barley, and other cereals that can be grown in certain districts, and could arrange to form joint-stock or co-operative societies to develop the, at present, latent potentialities of the centre, to the advantage of all concerned, not excepting the makers of agricultural machinery enterprising enough to assist in the initial development of so promising a centre.

* "The Need of Improved Methods of Cultivation in India," p. 31.

Reviews.

THE FEEDING OF CROPS AND STOCKS. Large crown 8vo., xiii. + 298 pp., including synopsis of contents and Index. 24 illustrations. By Mr. A. D. Hall, M.A., F.R.S., Author of "Fertilizers and Manures," "The Soil," &c. Price 5s. net. Mr. John Murray, Albemarle Street, London, W.

The above book, like its predecessors, is most interesting to read, and the contents can be understood by, or prove of use to, anyone engaged on the land. For the student it offers a general framework, or outline, of ideas on which he can, with greater ease and security, build up his scientific studies later on; whilst to the planter, too often sadly ignorant of the details of soil composition and changes, it gives, in the pleasant, chatty way of a favourite lecturer, full particulars of the soils, the plants, &c., growing therein, and the contents and values of the crops raised and how their food-content can be improved. These three books of Mr. Hall's should be in the hands of every agriculturist. In future issues we shall be publishing one or two articles on their contents, beginning with the March number.

SPON'S WORKSHOP RECEIPTS. Vol. iv. (from Rain-water Separation to Wire Ropes). New and thoroughly revised. 532 pp., 12 of index, and 321 illustrations. Price 3s. net. E. and F. Spon, Ltd., 57, Haymarket, London, W.; or Spon and Chamberlain, 123, Liberty Street, New York, U.S.A.

The present volume under review (for previous ones, see April and September, 1909, and July, 1910) covers a good deal of ground useful to agriculturists, and those engaged on up-country work. The articles on refrigeration, rope-making, sewage disposal, soap, solder and soldering, suction gas, taxidermy, preservation of tools, tying and splicing ropes, ventilation, water supplies for isolated centres and houses, weed-killers, whitewashing and distempering, and wire ropes, are items with which nearly all our readers have to do with more or less often. All such will certainly find the book of the greatest use to them.

We are again pleased to receive the annual report—the coming-of-age, or twenty-first number—of the Missouri Botanical Garden, St. Louis, issued by Dr. William Trelease, the Director. As on previous occasions, the book, bound in green cloth, runs into some 195 pages, and contains many illustrations and photographs, artistically reproduced. Among the contributors we noticed Professor Francis Lloyd, the Guayule expert, who writes on the embryo and seed of the Date (*Phœnix dactylifera*). With the question of root diseases and fungi to the fore just now, the article on "Fungous Root-tubercles," by E. G. Arzberger, and Mr. Perley Spaulding's article on "Fungi in Clay Mines," contains much information which seems likely to be of use and interest to anyone studying or troubled with fungous diseases. The report, as usual, can be obtained from Messrs. R. Friedländer and Sohn, Berlin; or W. Wesley and Son, 28, Essex Street, Strand, London. Price 5s.

COMPAGNIE DU KASAI, being a report of the *Mission permanente d'Etudes scientifiques*, in the Kasai Territory, edited and arranged by Professor Dr. de Wildéman, the well-known Director of the Jardin Botanique of Brussels.

We have not the space here to more than acknowledge this book, running into some 461 pages, each 9 in. × 11 in. It contains excellent photographs of Hevea and Funtumia trees and other economic plants in the Kasai area of the Belgian Congo, and the reading matter on coffee, cacao, vanilla, and especially on rubber cultivation, will be very closely followed by everyone interested in tropical Africa. Among the illustrations is one showing how the *L. thollonii* reproduces or throws up young plants from its roots, in the same way that the Guayule shrub does. Great importance is evidently attached to training the natives to produce large supplies of vegetables for local consumption, so as to ensure ample food supplies, and, at the same time, to attach them to the soil. This is an example many of the "estrada" owners in Brazil would be well advised to follow.

We shall probably have more to say at a later date on the rubber and cacao sections included in this report.

OUR review of Mr. Nöel Deerr's important work on "Cane Sugar," published by Mr. Norman Rodger, at Altrincham (Manchester), of which we gave an advance notice last month, must be held over for a future issue. The 600 pages that the book contains requires time for digestion. From a cursory examination its contents deserve the author's claim of forming a text-book of the agriculture of the sugar-cane, the manufacture of cane sugar, and the analysis of sugar house products. The whole has formed a valuable addition for the library of sugar-planters and experts. Written by one who has had exhaustive experience alike in the laboratory, the factory, and among the plants themselves, in the fields or at the experimental stations, Mr. Deerr's book cannot fail to be of the utmost importance to sugar-planters in these days of intensive and economical cultivation. Including postage it costs 22s.

THE FLORA OF JAMAICA. Vol. I. Orchids. (See TROPICAL LIFE for January, p. 7.) Price 10s. 6d., of the British Museum, Cromwell Road, S.W., or TROPICAL LIFE Publishing Department, 83-91, Great Titchfield Street, Oxford Street, W.

In our last issue we gave trade details of this book, which is the first volume of a series on the "Flora of Jamaica." When complete, the series will contain a description of all the flowering plants indigenous to the island.

An accurate and scientific knowledge of the physical characteristics, natural features, and living beings of any country is an indispensable preliminary to its development on lines which will most quickly and most surely bring well-being and riches to its inhabitants. For instance, the Government of the United States, as might be expected from a thoroughly practical nation, started on a scientific investigation of the Philippine Isles, as soon as these islands came under their control, following the example set by Great Britain in her numerous colonies.

As regards Jamaica, Sir Hans Sloane, in Charles II.'s reign, was the first to make collections there, which were described in his famous "Natural History of Jamaica," and these collections, together with others of all kinds from every part of the world, were acquired by the nation on his death and became the nucleus of the British Museum. Since his time the plants have been studied and described by various botanists, Linnæus, Plumer, Jacques, Swartz, Macfadyan, Grisebach, Urban, Britton, and others. Swartz wrote a "Flora of the West Indies" (1797-1806). Macfadyan commenced a "Flora of Jamaica," but only the two volumes had appeared when he died in 1850. Grisebach published a "Flora of the British West Indies" (1859-1864). Urban is publishing from time to time in his "Symbolæ Antillanai" descriptions of new species, and revisions of genera and families from all the West Indies—work which is most important and necessary, both because new species are found from time to time, and because science is constantly advancing. With these old-time authorities, whilst their work is of the utmost value, it is in some cases incomplete, and in others out of date. We are, therefore, grateful to the Trustees of the British Museum for publishing the handsome and useful volume before us (as well as for promising others), and to Messrs. Fawcett and Rendle for the labour expended upon it. Such a book will appeal to three classes of readers—first, to botanists; secondly, to orchid growers; and, thirdly, to tourists in Jamaica and to the inhabitants of the island.

We will leave botanists to criticize the scientific work, but, so far as we can judge, no pains have been spared to attain accuracy, both in the descriptions and scientific names. The beautiful drawings, made by Miss Wood from the living plants under Mr. Fawcett's direction, will be of the greatest service to all concerned in the examination of the plants and the determination of their names.

The introduction deals with the physical features in their bearing on vegetation, and also discusses the geographical distribution of the various plants. The authorities acted wisely in appointing Mr. Fawcett and Mr. Rendle to undertake the work.

The Pocket-Guide to the West Indies. By Algernon E. Aspinall. 5s. net. Duckworth and Co., 3, Henrietta Street, Covent Garden, W.C., London.

We are pleased to see this new and up-to-date edition of Mr. Aspinall's well-known guide, the author of which has recently refreshed his memory by another trip round the islands, when he found great improvements and many changes (for the better) on all sides. What we like about these guides is the chatty, and yet detailed, nature of the contents; nothing is missing, and yet you are not bothered with unnecessary advice. You are just taken on board, having first been told what clothes to wear, given your choice where to go, told how to get there, what to see on arrival, how much it will cost, and how you can arrange your banking accommodation so that ample funds will meet you wherever you go, provided, of course, that you first pay in at this end before you start. You read the guide exactly as if you were sitting facing the author in his well-known sanctum, and plying him with the questions that he here anticipates and answers, without giving you the trouble to think out what you want to know.

The Transport of Cuttings in Cold Storage.

The Assistant Curator at Kew, last July, returning by the "Campania" from America, brought with him a large quantity of new trees and shrubs from the Arnold Arboretum. By the kindness of the officials, reports the *Kew Bulletin*, two baskets containing about 50 packets of cuttings were placed in one of the cold-storage rooms, where the temperature during the voyage was kept at about 42° F. Ten days elapsed between taking the cuttings from the plants in the Arnold Arboretum and placing them in the propagating frames at Kew, but although this was in mid-July, they arrived almost as fresh as when they were cut, and only six sorts failed to strike root.

Mr. J. M. Hayman, late Deputy-Director of Agriculture of the United Provinces of Agra and Oudh, has been appointed by the British South Africa Company to superintend the commercial development of the Company's agricultural lands in Northern Rhodesia. Mr. Hayman is a graduate of the McGill University, Montreal, and will leave England about the end of this month. He will report upon the existing agricultural wealth of Northern Rhodesia in the form of cotton, rubber, and fibres, with special regard to their commercial importance and utility, and will investigate the possibility of establishing new industries by the cultivation of such products as have been proved by experience elsewhere to be capable of profitable development under similar conditions.

Those thinking of erecting steel-framed buildings in the Tropics for storage, estate factories, or residences, labourers' "lines," &c., should write to Messrs. Boulton and Paul, Ltd., at Norwich, for their catalogue. It includes some buildings that strike us as being as convenient as they are compact. The pages devoted to rubber factory apparatus for drying the rubber, transporting the latex, &c., will also command the careful attention of our readers.

Tropical Life at the Play.

Last week we were present at the Queen's Theatre, Shaftesbury Avenue, to see Mr. H. B. Irving and Miss Stella Patrick Campbell act as Charles Wogan and the Princess in "The Princess Clementina," to watch their adventures and admire their struggles (which would have ended in tragedy had they not proved successful), to stifle love for duty. The play, which is enjoying a splendid run, is founded on the novel "Clementina," by Mr. A. E. W. Mason, ex-M.P. for Coventry, and author of "The Broken Road," the novel which caused considerable sensation in Anglo-Indian circles a couple of years ago. We felt, therefore, that a play by such an author was certain to be interesting, and were not disappointed.

The theatre was well filled. In front of us was Mr. Alfred Lyttleton, M.P., who was Colonial Secretary from 1903-5, and a little way to our right sat Lord Brassey, who had presided the week before at the meeting of the Royal Colonial Institute, when Sir Daniel Morris read his paper on the Imperial Department of Agriculture in the West Indies.

The plot of the play is founded on a series of historical facts. The original Wogan, with the help of his friends Gaydon (Mr. Henry Vibart), Misset (Mr. Frederick Lloyd), and the "six-footer" O'Toole (Mr. Ernest Ruston), did truly liberate a real Princess Clementina, daughter of the dead John Sobieski, King of Poland, the Austrians having detained her to please George I., who wished to prevent her marriage with the Pretender. This fact was quite sufficient to force a romantic adventurer like Wogan to attempt to walk through brick walls to liberate her. If he did not quite do this, he and his friends, not forgetting Jenny (Miss Dorothea Baird [Mrs. H. B. Irving]), who impersonated the Princess whilst she was escaping, achieved deeds almost as wonderful. But it is the very human, as well as, or rather in sharp contrast to, the heroic side of the characters that so strongly appeals to the audience. Such a plot portrays on the stage what can be seen any day in London, or in the Tropics, the struggles that all men and women, at times, have to contend with and overcome, if they wish to prove successful in whatever object in life they are fighting for. Like Wogan and the Princess, it is right to risk one's fate rather than to remain mere nonenities; but the stay-at-home, who thinks Nature, either human, physical, or material, can win without at times risking both life and happiness, should go to see such plays and learn otherwise. They make you think, and that does everyone good. Miss Helen Rous, as the Princess's mother, rose fully equal to the difficult part she had to play in the second act. Mr. Irving, at times, especially when he staggers in against the burst-open door at the "Green Cross," reminded one a good deal of his father, and his acting of Wogan, boastful, but sternly sensible of his duty, was very lifelike. He had need to be stern with Miss Patrick Campbell as the heroine—very plucky when she was in danger, but a bewitching danger for Wogan when she was safe. This is the first time we have seen Miss Patrick Campbell act. We are looking forward with the pleasantest anticipation to seeing her again.

Cotton.

THE following were the prices for Cotton in London on February 9th, according to Messrs. Slann and Davies :—

	Good Fair.	Good.	Fine.	Superfine.	Good 1910.	Good 1909.	Compare
	d. d.	d. d.	d. d.	d.	d. d.	d. d.	
Surat kinds* ...	$6\frac{5}{16}$ to $7\frac{1}{8}$	$7\frac{3}{16}$ to $7\frac{7}{16}$	$7\frac{7}{16}$ to $7\frac{3}{4}$	—	$6\frac{1}{16}$ to $7\frac{1}{4}$	$4\frac{1}{2}$ to $4\frac{3}{4}$	per lb.
Madras	$7\frac{1}{4}$ to $7\frac{3}{8}$	$7\frac{5}{16}$ to $7\frac{5}{8}$	—	—	$6\frac{1}{4}$ to $7\frac{3}{16}$	4 to $4\frac{15}{16}$	—
Bengal	—	$6\frac{5}{16}$	$6\frac{9}{16}$	$6\frac{11}{16}$	$5\frac{7}{16}$	$3\frac{3}{4}$	—
Assam	—	$6\frac{3}{4}$	$7\frac{3}{4}$	$8\frac{1}{4}$	6	$4\frac{3}{8}$	—
China	—	$6\frac{3}{4}$	$7\frac{1}{8}$	$7\frac{3}{8}$	$6\frac{5}{8}$	$4\frac{5}{8}$	—
West Indian ...	$8\frac{1}{4}$	9	$9\frac{1}{2}$	$9\frac{3}{4}$	$7\frac{3}{4}$	$5\frac{1}{4}$	—
Sea Island ...	$13\frac{1}{2}$	16	20	23	15	8	—
West African ...	7	$7\frac{5}{8}$	$7\frac{15}{16}$	—	—	—	—
East ,, ...	$7\frac{7}{8}$	$8\frac{3}{4}$	$10\frac{3}{8}$	—	—	—	—

* Liverpool quotations.

A sharp downward movement in American "Futures" set in last Friday morning, and has brought about a fall averaging $\frac{1}{4}$d. per lb. all round. A poor Manchester demand, heavy realizing in New York, and news of needed rain having fallen in the South have been the depressing factors. The Spot quotation (February 9th) has been reduced from 7.93d. to 7.71d. East Indian shows a further decline.

The import into Liverpool this week amounted to 213,177 bales, since June 1st 3,151,164, same week last year 32,313, last year's total 1,958,629 bales. The estimated Sales amount to 50,000 bales, including "called." Middling American is quoted at 7.71d. per lb., last year 8.14d., 1909, 5.11d.

Movement of American Cotton since September 1st :—

	1910-11.	1909-10.	1908-09.
Brought into sight	9,594,000	8,106,000	10,324,000
Exports from United States since September 1st—			
To Great Britain	2,694,000	1,620,000	2,625,000
To Continent, &c.	2,744,000	2,557,000	3,202,000
Total crop	—	—	13,825,000

The latest quotations of Americans for delivery, basis middling, any port, G.O.C. :—

	February 9th.	Last Week.	Last Year.
	d.	d.	d.
February	7.48	$7.72\frac{1}{2}$	7.93
Feb.—Mar.	7.48	$7.72\frac{1}{2}$	7.92
Mar.—Apl.	$7.49\frac{1}{2}$	7.76	7.92

Coffee.

By Messrs. C. M. AND C. WOODHOUSE.

THE general tone of the market during the past week, ending February 14th, has been easier, and most descriptions show a decline of 1s. to 2s. per cwt. 520 bags of East India, chiefly Coorg, sold, values being 1s. to 2s. lower. Costa Rica and Guatemala are about 2s. per cwt. cheaper, the bold sizes of Costa Rica showing a still further decline. Colombian dull and easier, and Dumont Santos is 1s. to 2s. below last week's rates. The stocks in the principal ports of Europe on February 1st, according to Messrs. Düüring and Zoon, show an increase for the month of 46,000 bags, against an increase of 762,000 bags last year, whilst the visible supplies show a decrease of 551,000 bags, against a decrease of 766,000 bags at the same time in 1910. "Futures" show a further considerable decline, and though there has been some recovery from the lowest point, the latest value of September Santos is 3s. $7\frac{1}{2}$d. lower for the week. We quote :—

		To-day.	Feb. 2nd, 1911.
London ..	Santos, Sept. delivery	44s. 9d.	48s. $4\frac{1}{2}$d.
New York ..	No. 7 Rio ,, ,,	9·50 cents	10·30 cents.
Hamburg ..	Santos ,, ,,	49 pf.	$54\frac{1}{2}$ pf.
Havre ..	Santos ,, ,,	62 francs	$66\frac{1}{2}$ francs.

The receipts at Rio and Santos from July 1st, 1910, to February 8th, 1911, were 9,462,000 bags, against 13,358,000 bags and 10,526,000 bags in the two previous seasons respectively.

Sales include the following, viz. :—

East India.—520 bags, viz. :—Coorg: 67s. to 68s. for middling, 68s. to 71s. 6d. for bold; Neilgherry, &c. : 62s. 6d. to 64s. for smalls, 67s. to 72s. for middling, 70s. to 77s. for bold.

Mocha.—50 packages, at 74s. for longberry.

Jamaica.—56 barrels and bags, at 61s. for smalls, 64s. 6d. for fine ordinary, 67s. for common bold.

Costa Rica.—2,850 bags, at 62s. to 66s. 6d. for smalls, 60s. to 66s. 6d. for good ordinary to low middling, 68s. 6d. to 71s. 6d. for middling to good middling, 65s. to 71s. for ordinary to good middling bold, 72s. 6d. to 79s. 6d. for good to fine bold.

Guatemala.—1,235 bags, at 63s. to 64s. 6d. for smalls, 64s. to 67s. for fine ordinary to middling, 67s. to 71s. for bold.

Salvador.—85 bags, at 65s. 6d. for low middling, 68s. for bold.

Mexican.—540 bags, at 63s. 6d. to 66s. for smalls, 66s. to 68s. 6d. for middling to good middling, 67s. 6d. to 70s. for bold.

Ecuador.—27 bags, at 59s. for ordinary pale.

Colombian, &c.—600 bags, at 64s. to 65s. for smalls, 63s. 6d. to 67s. 6d. for fine ordinary to middling, 66s. to 70s. 6d. for bold.

Dumont Santos.—950 bags, washed, at 57s. for smalls, 59s. for medium, 59s. 6d. to 61s. 6d. for bold; unwashed, at 57s. 9d. for smalls, 58s. 9d. for medium.

The India-rubber Market.

By Messrs. S. Figgis and Co.

News last month from Brazil of the Government banks advancing money on considerable quantities of rubber in Manaos frightened "bears," and induced some trade buying at rapidly advancing prices, as high as 5s. 9d. being paid for fine hard, 5s. 4d. soft, 4s. 2d. for ball. On January 27th we closed with hard fine spot and near at 5s. 5½d., forward 5s. 7d. to 5s. 8d.; soft fine spot and near at 5s., forward 5s. 1d. to 5s. 2d. Caucho ball steady, near 4s. 1d., distant 4s. Considerable sales had been made of plantation up to 5s. 4d. pale crêpe and biscuits, forward delivery.

During the first week in February the Pará market was firm and higher, up to 6s. 3d. being paid for near and 6s. 4d. for distant, but on February 10th a rapid decline of 3d. took place, and sales included:—Hard cure fine down to 5s. 8d., near and forward delivery; soft cure fine at 5s. 8d. to 5s. 6d., April-May delivery. Caucho ball, up-river, f.a.q. spot and forward, sold up to 4s. 5d., closing at 4s. 3½d. Large spot sales of Bolivian ball, according to quality, at 3s. 11d., and up to 4s. 2½d.

At the auctions on February 14th to 16th 320 tons of Plantation were offered, and, as was expected, prices advanced considerably, being 10d. to 1s. above last rates. Hard Pará continued to fluctuate. Medium descriptions are active and a large business has been done, say:—Hard fine, spot 6s. 1d., forward 6s. 2d. to 6s. 3d.; soft fine, spot 5s. 5d. to 5s. 6d., forward 5s. 6d. to 5s. 7d. Negrohead, scrappy Manaos, sales at 4s. 3d. to 4s. 4d.; Cametas scarce, about 3s. 4d.; Island scarce, about 3s. 2d. Caucho Ball dearer, buyers of up-river f.a.q. at 4s. 4d.; Lower Amazon about 4s.

At the auctions, Plantation Malay sold: Sheets, fair to fine smoked, 6s. 6½d. to 6s. 11¾d.; part smoked, 6s. 0¾d. to 6s. 5¼d.; fair to fine unsmoked, 6s. 0¼d. to 6s. 3¼d.; damp, pressed and immature, 5s. 7d. to 5s. 11¾d. Crêpe, fair to fine pale, 5s. 11d. to 6s. 5¾d.; fair to good palish, 5s. 11d. to 6s. 5¾d.; light brown and grey, part streaky, 5s. 8½d. to 6s. 3½d.; clean brown, 5s. 5d. to 6s. 1d.; dark brown, part specky, 5s. 3¼d. to 5s. 10¾d.; black and soft, 5s. 1¼d. to 5s. 10d.; smoked palish, 6s. 2d. to 6s. 3¾d.; smoked dark, 6s. 1¾d. Scrap and virgin, fair to fine, 4s. 6d. to 5s. 4¼d.; mixed and inferior, 3s. 6d. to 3s. 11d. Rambong scrap, 4s. 8d. to 5s. 0½d.

Ceylon.—Sheets and biscuits, good smoked, 6s. 9d. to 6s. 9½d.; fair to fine unsmoked, 6s. 0¼d. to 6s. 4¼d.; pressed and damp, 5s. 9d. to 6s. 1d.; Ceará, 5s. 4½d. to 5s. 6½d. Crêpe, thick, fair to fine, 6s. 3½d. to 6s. 6¼d.; fair to fine pale, 6s. 1d. to 6s. 5d.; fair palish, 6s. 1d. to 6s. 5d.; light brown, 5s. 10d. to 6s. 2½d.; dark brown, 5s. 6d. to 5s. 11d.; black and soft, 5s. to 5s. 8½d.; smoked, 6s. to 6s. 0¼d. Scrap, cuttings and virgin, fair, fine, 4s. 8d. to 5s. 4d.; mixed and inferior, 3s. 2d. to 3s. 9¼d.

Brazil Ceará.—8 cwts. fair pale sheets, 5s. 7½d.

Mollendo.—Fine, 5s. 3½d.; fair scrappy, 3s. 6½d.

Mattogrosso and Mangabeira.—Fair Mattogrosso virgin, 5s.; scrappy Mattogrosso virgin, 4s. 4d.; fair Mangabeira sheet, 3s. 2d.

Central American and Columbian, &c.—Whitish Mexican Plantation block, 4s. 9¾d.

Mozambique, Zanzibar, &c.—Sold well. Pressed brown Manihot crêpe, 3s. 10½d. to 4s. 7½d.; fair red ball, 4s. 10d. to 4s. 10¼d.; mixed red ball, 4s. 2d.; pressed reddish Mombasa stripes, 4s.; Nyasa, Ceará biscuits, 4s. 4d. to 5s.

Malaysian.—Dark crêpe, slightly smoked, 4s. 6d. to 4s. 8½d.; black crêpe, slightly smoked, 4s. 3d. to 4s. 4¾d.; black crêpe, pressed, 4s. to 4s. 1½d.

Maniçoba.—Rather sandy scrap, 3s. 6½d.

Pará rubber statistics for the month of January (tons):—

	Pará.	Caucho.	1911.	1910.	1909.	1908.
Receipts at Pará ..	3,580	550 =	4,130 agst	5,490	5,490	4,860
Shipments to Europe	1,110	290 =	1,400 ,,	2,090	2,830	2,550
,, America	1,410	80 =	1,490 ,,	2,700	2,210	1,630

Crop statistics, June 30th, 1910, to January 31st, 1911 (seven months):—

		Pará.	Caucho.	1910-11.	1909-10.	1908-09.	1907-08.
Pará Receipts	1910-11	17,080	2,830	19,910	22,200	21,240	19,100
	1909-10	19,320	2,880				
,, Shipts., Europe		7,940	2,120	10,060	9,680	9,810	10,740
,, ,, America		7,680	660	8,340	11,020	10,620	7,180

Tea.

By Messrs. Wm. Jas. and Hy. Thompson.

By mid-February there had been further improvement in the tone of the market during the previous week, especially among Indian teas, where the strong demand for all grades up to about 8½d. per lb. has resulted in an occasional advance.

The market for Indian teas generally could be quoted as strong for all grades on the basis of last prices with here and there a quotation in favour of sellers. The price of fair common Souchong is still 7½d. per lb., but much less was available than at last week's auctions. Leaf teas were again in request, particularly useful Assam descriptions about 8d.—8½d. per lb. Among medium grades without special character there is no change to note, but where any improvement in quality or autumnal flavour was apparent prices advanced and from the Dooars district some good averages were obtained. Southern Indian teas sold freely at fully late values, with useful Brokens here and there improving a fraction. To date six final invoices have been printed. The highest averages from the various districts were:—Darjeeling: Goomtee, 1s. 5d.; Dooteriah, 1s. 1d.; Thurbo, 1s. 0¾d. Assam: Jaipur, 1s. 1¼d.; Sealkotee, 1s.; Itakhoolie, 11¾d. Dooars: Putharjhora, 11d.; Killcott, 9½d.; Nagrakatta, 9½d. For the whole sale on estate account the average was 8⅝d. per lb., which compares with 8⅛d. per lb. a year ago.

For Ceylons the market generally is steady to firm, the most noticeable feature of the sale being the strong bidding for the more useful liquoring kinds between, say, 8d. and 9d. Plain teas without any particular character, although selling at last week's rates, have not been as much run after as they were last week; and where quality has shown any further falling-off, prices have dropped proportionately. Good-class Pekoes and Orange Pekoes met with fair but somewhat irregular support. Dusts and fannings, especially those with good flavour, sold at full to rather dearer rates. The highest averages were:—Goatfell, 1s. 0¼d.; Diyanilakelle, 11d.; Kenmare, 10¾d.; Cranley, Nutbourne, 10½d.; Udaradella, West Fassifern,

10¼d.; Glendevon, St. Leonards, 10d. The result for the whole sale on garden account being 8¾d. per lb. against 8¼d. per lb. in 1910.

Privately business has been transacted in Chinas among low black and red leaf descriptions, the demand for which has now brought the quotation up to 5¾d. per lb., with only an occasional parcel of inferior quality to be found at 5½d. per lb. Among better teas a few contracts have been passed, notably among Keemuns round about 11d. to 1s. per lb.

Following the firm market for other grades, the Java sale passed with a strong tone for all grades, lower kinds showing a hardening tendency. The best averages were:—Goalpara, 10½d.; Tjiwangie, 9d.; Sedep, 8⅜d. For the whole sale on estate account the result was 8¾d. per lb., against 7⅝d. per lb. last year.

At the second sale of the year held in Amsterdam on the 2nd inst., 8,707 packages of Javas were catalogued. Quality was good. There was a strong demand, though prices bid were often slightly under previous quotations. Importers, however, were firm, and a number of teas were withdrawn.

Sugar.

Writing on February 9th, Mr. C. Czarnikow reported that a better demand for refined, probably helped by low estimates of the Cuban crop circulated in some quarters, caused a better tone in the sugar market generally, and May beet, the barometer in sugar centres just now, improved from 9s. 3¾d. to 9s. 5½d., reacting again to 9s. 4½d. on the Cuban receipts for last week reaching a total of 90,000 tons, and since fluctuating between 9s. 4¾d. and 9s. 5¼d., closing at 9s. 5d.

Cuba remains the centre of attention, and we should say that a production of 229,000 tons up to date, to which total the figures were rectified yesterday, is a very fair showing for a crop which started a fortnight late. The very pessimistic reports one hears of have, so far, not found any confirmation in well-informed circles; a certain deficiency, which, at the same time, will not interfere with supplies for the United States this side of October or November, has been expected all along.

The latest advices from the Philippines put the production for 1909-10 at 120,000 tons, of which 100,000 tons went to the United States and 20,000 tons to China. This season's production should reach 180,000 tons, and assuming that 20,000 tons again find their way to China, there would be some 160,000 tons available for the States. The indications from Java are for an early and abundant crop.

The American market became slightly firmer, and a large business was done to speculators in Cubas for second half February-March shipment at 2 3-16 cents =3.54 cents duty paid. Since, however, a sale has been made at 1-16 cent less. The spot quotation is 3.48 cents=9s. 9½d. c.i.f. for Cubans=8s. 3½d. c.i.f. for 96 per cent. Javas=7s. 3½d. f.o.b. Hamburg for 88 per cent. net beet. Refining grades of cane sugar in United Kingdom have been in good demand, but supplies are only very moderate. Beyond 5,000 to 6,000 tons San Domingos sold to arrive to refiners, there is little to report. Grocery crystallized at auction sold well at fully steady to rather dearer rates. Low sugars are more inquired for, but offers are upon a very limited scale.

As regards cane-producing countries, the West India mail reports that in Trinidad the weather is dry and well suited for reaping the canes, but in Barbados the crop has suffered somewhat from drought. Present indications point to a total of 50,000 to 52,000 tons being reached, but until actual grinding commences and the average yield of the canes ascertained, it is impossible to form an accurate estimate. In St. Croix the crop is small owing to the lack of rain experienced last summer. From Natal we hear that the current crop will approximate 82,000 tons, as against 62,000 tons last season. A severe cyclone passed over Mauritius, causing slight injury to the young canes in some districts, but in Reunion greater damage has been done, though to what extent is not known, cable communication being interrupted.

The total transactions of British West India for the week amount to about 7,000 bags. Crystallized Demerara, middling grey 14s. 9d. duty paid, middling yellow 14s. 10½d. to 15s., good middling yellow 15s. 3d., good yellow 15s. 9d. to 16s., fine yellow and pale 16s. 3d. to 16s. 9d.; Syrups, black and dark brown 9s. to 9s. 3d., strong brown 10s. 9d. to 11s., low strong yellow 11s. 6d., middling soft greyish 11s. 9d., good middling pale greyish yellow 13s. 3d., middling soft yellow 13s. 6d.; Trinidad Syrups, low heavy brown 10s. to 10s. 3d.

At auction, 1,307 mats brown Mauritius Syrups sold at 9s. to 9s. 6d. duty paid.

2,404 bags crystallized Surinam sold, middling yellow 14s. 9d. to 15s. duty paid, good middling to good pale 15s. 3d. to 16s.

500 pockets Guatemala Syrups sold at auction, strong brown 10s. 3d. to 10s. 6d., soft greyish yellow 11s. to 11s. 3d. duty paid.

250 pockets San Salvador Syrups sold, good soft greyish brown 11s. duty paid, fine bright brown 12s. 6d., good yellow 14s. 6d.

2,800 bags Brazil, low brown old import realized 9s. 6d. duty paid.

Rubber Share Market.

During the week ending February 9th the market was in a very interesting condition, but it is not easy to see one's way very far ahead. Rubber, after quickly improving to 6s. 2d., has eased off again to 6s. 0½d. The "knowing" people are not particularly full of information as to the position of rubber things generally, and few appear very certain regarding the immediate outlook for either the material or share market. But from what we have seen, there continues a very intelligent sorting of rubber shares by investors who are not asleep. Cheap shares of promise are being locked away in the nursery, and there is little doubt that many of them will blossom into income-swellers of no trivial importance. The latest reports show that Allagars are a shade easier at 4s. 9d., but Anglo-Malays remain firm at 22s. Batu Caves at 15 are unchanged. Batu Tigas have relapsed 1-16, to 4 5-16, but Beverleys are steady at 3s. British North Borneo Trusts have come in for further attention around 4s. discount, but Bukit Mertajams have sagged to 3s. 3d. Ciceleys at 2¼ are unchanged. Consolidated Malays have been

done at 22s. 7½d., and Dennistowns are slightly better at 1 3-16 bid. Duckwaris are just 3s. Eastern Trusts have been 7-16 premium rather buyers, but are now easier at ⅜ premium. Glendons are a shade harder at 4. Highlands and Lowlands have been rather erratic, touching 4 15-16 buyers, then relapsing to 4¾, and afterwards strengthening to 4⅞. Jerams have been purchased largely at 15-16 premium, and are now 1 premium buyers. Johore Rubber Lands have risen 1-16, to ⅝ premium. Kuala Lumpurs show improvement at 7¾, and Lankat Sumatras are a good market at 3⅛. Lankat Rubbers at 2 are steady, and Linggis have been bid for at 45s. 6d., but are now not quite at their best, being only 45s. 3d. London Asiatics are a good spot, and are wanted at 13s. 6d. Malaccas are unaltered at 8, but Merlimaus are better, being bid for at 5s. 6d. Mid-East Trusts have been bought in fair numbers around 5-16 discount. Patalings have improved to 2 13-16, and Pelepahs are firm at 4s. 1½d. Peraks have changed hands freely at 7s. 9d., while Seafields have had a further rise to 6½. Selangors at 2¾ are steady, and Sengats keep hard at 5s. 3d. Sempahs are very disappointing at 1-16 discount, and people are nervously beginning to sell out and re-invest in companies about which more can be gleaned regarding operations. Serembans have risen, on further buying, to 4 7-16, and Straits Bertams at 7s. 9d. are a good market. Strathislas are unchanged at 3d. premium, but Sumatra Parás have risen to 11s. 3d. Tanjong Malims found buyers at 5-16 premium. Tebraus remain steady at 3⅛. United Serdangs are 5⅜, and United Sumatras look buyers at 8s. Vallambrosas, after rising to 35s., are now 34s. 3d. bid.

The London Cocoa Market.

By THE EDITOR.

IT is always pleasant to begin with good news, so I will do so. First, the cocoa market is firm, and prices since last month have tended upward; secondly, the Board of Trade figures for January have begun the year well by showing an increase in the deliveries for H.C. over last year. This is all the more satisfactory, coming as it does immediately after the big increase in the previous month (December). It is only to be hoped that the United Kingdom will keep it up throughout the year. With the strong demand and steady buying of cocoa that has continued uninterruptedly since the beginning of December, the larger deliveries are not surprising, but not being so, does not diminish the satisfaction; only, as I have already said, it must be kept up. Here are the figures:—

Raw cocoa only—	Landed.	Del'd. H.C.	Export.	Stock.
January 1908—	3,818	2,511	545	5,885 tons
,, 1909—	3,986	1,949	539	10,143 ,,
,, 1910—	4,515	2,364	627	11,405 ,,
Increases	529	415	88	1,262 ,,

The deliveries of foreign manufactured in January were 1,194,293 lb., against 1,034,523 lb. last year, or 160,000 lb. (70 tons) more.

The feature of the last four or five weeks has been the steady and persistent buying, both for the home trade and for export.

The sales up at Liverpool have been equally busy, at times even more so than in London, and the Liverpool movements for January have been very heavy—nearly 93,000 bags landed (92,812 to be exact), and 71,126 bags delivered—not bad for a single month. Havre, from its published reports, would have shown up better, but could not get the cocoa to deal in. The landings, though heavy, and exceeding the deliveries, were evidently "tied up" in execution of orders, and so were not available for sale. This being so, the increase in the stock of 7,000 bags since the end of December (when it stood at 235,836 bags) does not count for anything in regard to supply and demand. Taking the matter of stocks first, these stood as follows on the dates mentioned:—

Havre Stock, January 31st—	1911.	Value. Fcs.	1910.	Value. Fcs.
Pará	22,037	68 to 72·50	20,599	66·50 to 72
Bahia	30,524	67·50 to 74	20,869	64 to 68
Venezuelan	40,908	66 to 175	42,315	64 ,, 140
Trinidads	51,188	73 ,, 78	29,616	70 to 72·50
Grenada and other W.I.	4,094	65 ,, 75	4,993	61 to 69
San Thomé	19,014	67 ,, 70	15,274	65 to 67·50
San Domingo	2,883	62 to 67·50	14,981	58 to 63
Haiti	12,309	57 to 68	11,587	52 ,, 64
Accra	26,461	62 ,, 66	12,084	49 ,, 62
Guayaquil	12,180	72 ,, 84	9,097	76 ,, 84
Divers	21,057	—	19,891	—
Totals	242,655 bags.		201,306 bags.	

London Stock, Feb. 11th—	1911. Bags.	1910. Bags.
Trinidads	4,720	8,982
Grenadas	12,291	19,148
Other W.I.	4,365	5,078
British West Africa	6,089	5,615
Portuguese W. Africa	5,541	1,165
German West Africa	6,544	1,218
Ceylon and Java	11,014	24,045
Guayaquils	38,658	17,300
Brazil and Bahia	706	2,212
Other Foreigns	11,686	13,472
Totals	101,614	98,235 bags.

Coming now to the various growths and the competition for them in the open market, Grenadas perhaps could again claim to be the favourite, but many others—Trinidads, other West Indian, West African, &c.—have been driving her very close. There is no doubt that, taking the market as a whole, the demand for medium cocoas, as good to fine West Indian, superior Bahias, good middling red Trinidads has been, and still is, excellent—from the sellers' point of view. In Havre also fine Haitian has been selling more easily than the commoner qualities, and the better Bahias sold quicker than the cheaper kinds. Both San Domingos and Accra kinds seem to change hands without much trouble, and at prices that no seller should complain of. Fine Trinidads are not much wanted; the sales reported have only been for good middling red, and although fine to superior are valued, on the sales of the cheaper grade, at 64s. to 68s., such prices are quite nominal, and no important sales have been made. The Guayaquil output opened on a continued large scale, for January (40,000 qtls., against 13,000 in January, 1910, and 19,000 in 1909), but this has not prevented the growth from stiffening up in price in sympathy with other kinds.

In giving the following quotations, readers should compare present prices with last month and those in December. Judging from the latest business done, including the sales of February 14th, present values run as follows:—

Trinidads.—Good middling red marks, 61s. to 63s. 6d.; middling red, 60s. and 60s. 6d.; while fine to superior are valued at 64s. to 68s.

Grenadas.—Good to fine marks sold at 57s. to 58s., against 56s. 6d. last month; common unfermented to fair fermented, 53s. to 56s. 6d.

Dominicas.—Good to fine marks, 55s. to 56s. 6d.; ordinary unfermented to fair fermented, 52s. to 54s.

Jamaican.—Good red sold at 55s. to 56s.; low unfermented, 51s.; ordinary to fair fermented 53s. to 53s. 6d.

St. Lucia.—Good to fine marks, 56s. to 57s.; common unfermented to fair fermented, 53s. to 55s. 6d.

West Coast Africa.—Good red boldish sold up to 53s. 6d.; fair reddish at 50s. Up at Liverpool sales vary between 48s. and 51s.

Puerto Cabello.—Fine sold at 110s.

Samoa.—Good plump sold at 73s.

Surinam realized 54s. to 57s.

German Cameroons.—At the end of January a substantial pile of well-fermented and bold, but "hammy" sold at 56s. to 57s.

Costa Rica sold up to 57s.; fair reddish, 54s.

Java.—Good bold realized 67s. to 69s. 6d.

Guayaquil.—Arriba has been selling up to 65s., but the last sale included Manta at 60s., and good Arriba at 63s. 6d.; Caraquez at 57s. to 60s.

Ceylon.—Fine marks, 73s. to 78s.; fair to good medium and bold, 68s. to 71s.; ordinary to fair, 64s. to 66s.

The following were the deliveries for consumption last year, compared to 1909 and 1908:—

January—December—	1910.	1909.	1908.	
U.S.A., 12 months ..	49,340	49,524	40,568	tons Engl.
Germany, 12 months ..	43,941	40,725	33,738	,, ,,
France ,, ,, ..	24,697	22,910	20,142	,, ,,
U.K., ,, ,, ..	23,703	23,883	20,738	,, ,,
Holland ,, ,, ..	18,884	19,081	15,571	,, ,,
Belgium ,, ,, ..	4,716	4,930	4,482	,, ,,
Totals ..	165,281	161,053	135,239	,, ,,

The figures given in February last year for Holland and Belgium were for "imports," not "deliveries for consumption." I mention this, as no note seems to have been made of it at the time. On comparison, therefore, the above figures for 1908 and 1909 would not agree with those given last year, and yet each are correct in their way.

During the latter part of the week ending February 18th, whilst the market remained quite steady, prices showed signs of "marking time," and even going back slightly. No Grenadas were sold during the week at 58s., 56s. 6d. to 57s. being the highest price obtainable, and at these figures about 150 bags changed hands. Although supplies from Trinidad are still restricted, the demand for the moment is less keen, and lower c.i.f. quotations, both for this growth and Bahias, are spoiling "spot" sales. For Guayaquils, "to arrive," the tone is also easier and quotations lower.

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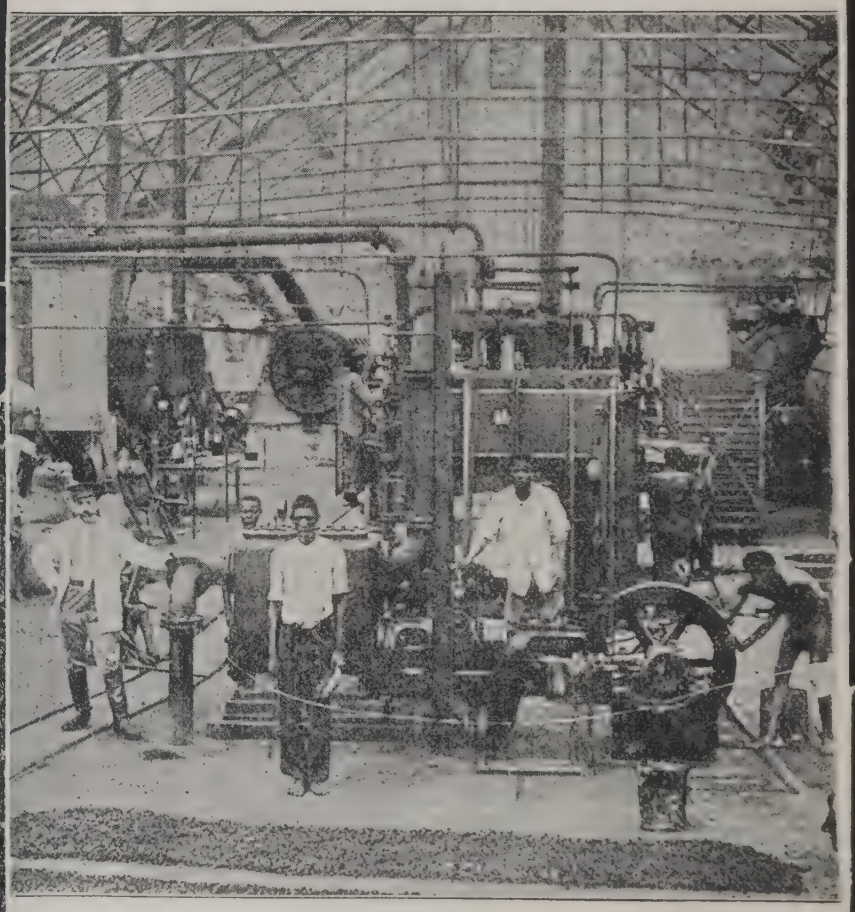

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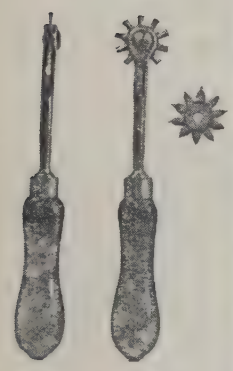

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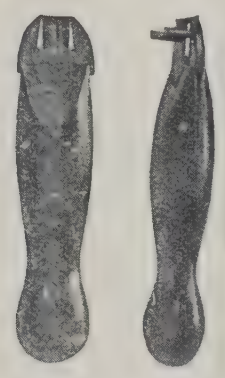

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Our Latest Publication.

"NOTES ON PLANT AND SOIL SANITATION."

WE are pleased to report that the above work has been published within the last few days, and, as stated in our advertisements, is divided up into sections, the whole book running into some 720 pages, including 108 illustrations. As every page contains at least one useful piece of information, and most of them contain several, the author devoted special attention to the drawing up of the index and synopsis, so as to show at a glance the information to be culled from the book. The work of drawing up these was very great, but those who have seen them in print agree that they are indispensable to such a work. The cultivation of the various rubbers is fully gone into, and also the management of cacao estates. Professor Dunstan's introduction adds great weight to the contents, and his remarks, confirming, as he does, what the leading agricultural experts in the Tropics have said on estate management, the opening up of new lands, &c., make the book one of the most important yet published on general estate management. Those who wish to specialize can easily do so, using us as a stepping-stone, but stepping-stones must be employed first. Even when returning the roughly-put-up proofs of the first 200 pages, our collaborators spoke well of their utility. That being so, we feel that the finished tome will call forth even more appreciative remarks than the following:—

"I have read through the proofs of your book. It is a work that there is a distinct need for."—Howard Newport, Kamerunga State Nursery, Queensland.

"I think it is very good indeed." R. D. Anstead, Planting Expert to the Government, Bangalore.

"The whole matter is treated so exhaustively that I can hardly add anything."—Professor H. C. Hendrichsen,* President Cuban Horticultural Society.

"I am very interested in your book, and am looking forward to its issue."—W. M. Malins-Smith, Cacao Expert, Grenada, W.I.

"I have read your proof with the greatest interest. It is of importance to awaken the various Governments and planters to the need of preventive action against plant pests."—W. J. Gallagher, ex-Director Agriculture, Kuala Lumpur.

THE Belgian Committee (at Antwerp) for the International Rubber Exhibition have informed the Manager, Mr. A. Staines Manders, that they will award a trophy to the value of 1,000 fcs. for some special exhibit, and have left arrangements in the hands of the Manager.

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* Professor Hendrichsen, later, however, we are glad to say, contributed an important illustrated article on cacao cultivation.

ACCORDING to the *Philippine Agricultural Review*, the best land for the cultivation of kapok (*Eriodendron anfractuosum*) is porous, sandy clay soil near the sea-level or a little above it. As there seems some demand for the cotton, it may be worth while planting waste land on the sea-boards with these trees as wind breaks, with the idea of realizing some returns from their crops. In Java the trees are often planted along the roads on the coffee and cacao plantations, generally 12 to 15 ft. apart. Where kapok is planted as the main crop, 250 trees per bouw (1¾ acres), or 144 trees per acre, or 17 by 17 ft., is the maximum number that should be planted; the richer the soil the fewer must be the trees. During the first years one can plant catch crops between the trees; but if not, it will be very useful to plant leguminous crops of some description. Cases have been known of a single tree giving 1 picul (133⅓ lb.) of clean kapok, but such a yield is exceptional. At five years, 5 piculs, or 667 lb. per 250 trees should be obtainable.

CEARA planting is increasing in the Bahamas, and the islands may still make their mark as a rubber-producing centre. Maybe the total output will not amount to thousands of tons, but even a few hundred tons of a good class of rubber is always acceptable, and if the industry could be extended and established in the islands, either alone or in connection with sisal estates, the benefits to the islands would be substantial. Meanwhile our correspondent out there reports that experiments with the rubber are being carried on in the outer islands. About two years ago some 120,000 seeds were distributed, and in some places the trees are doing well. Although still in the experimental stage, sufficient has been done to make the agricultural authorities feel that Ceará will do well in many of the islands if lack of capital does not discourage planting. Those trading with, or interested in, these islands should therefore continue the experiments on a commercial basis.

THE London papers, at the beginning of the month, reported that a German patent had been secured for the manufacture from the Soya bean of a product to take the place of rubber. The process consists in the reduction of the oil of the Soya bean to a thick, tough liquid through the addition of nitric acid. After further treatment with alkaloid solutions the mixture is heated to 150°, giving a tough, highly elastic product similar to rubber, which can be vulcanized by the same process as rubber. No information on the question of cost has so far been mentioned.

THE rubber market has been fairly active of late, and the sales up at Liverpool total about 200 tons, including hard fine March-April 7s. 1d. to 6s. 8d. to 6s. 10d. to 6s. 9½d., April-May 7s. 2d. to 6s. 9d. to 6s. 11d. to 6s. 9½d., May-June 7s. 1d. to 6s. 9½d. to 6s. 11½d., Manaos scrappy April-May 5s. 2d., and Peruvian scrappy spot 5s. per lb. Medium Brazilian grades have been quiet, but prices are unchanged, and the sales include Pernam scrap 2s. 5½d. and Mangabeira at 3s. 2d. per lb.

Child Labour in the American Cotton Factories.

UNDER instructions of the American Senate, an official "Report on the Condition of Woman and Child Labour in the United States," in the cotton textile industry, has been prepared by Mr. Charles P. Neill, Commissioner of Labour, and his staff. The work involved in preparing such a report, covering over a thousand pages, must have been enormous, but it is worth all the time, work, and money it has cost. The report shows that in some of the States 20 per cent. of the employés are under 20 years of age, and 8.6 per cent. were only 12 to 13 years old. It is often doubtful whether the number of years returned are not above the children's real age. One girl returned as being 15 years old did not show signs of being more than 10 or 11 years old. The fact that the children were hidden away or sent home when inspectors were about showed that some of the factories at least were wilfully and knowingly breaking the law, which limits the age to 14. It is indeed wonderful to us how the lower and lowest classes in all countries insist in imprisoning themselves and, worse still, their young children in factories. Surely there is some way to induce and, if necessary, to force by law a larger proportion of such folks to go on to the land and help raise produce, fat stock, pigs, &c., and so help to reduce the high price of food, instead of leaving them to be forced by necessity and hunger (much more relentless tyrants than any human law) to herd into factories and lead a life of incessant, hopeless, drudgery, whilst turning out goods at needlessly low prices, which are often a drug in the market. We know the cheap piece-cotton trade, at 2 cents and 3 cents a yard, in the Tropics and elsewhere. The world can get on very well without it. A little less money spent on clothing, or a little less clothing, if it comes to the pinch, would surely be much more moral than imprisoning children in these modern bastilles when they ought to be out in the open. Modern educational methods must be altered, and, as we are always urging, children should be trained, not only to be agriculturists, but to be so along right lines—*i.e.*, to band together and co-operate both in buying their supplies and preparing and selling their produce. Cheap clothing has many advantages, but cheap food has more; even advantages can be too dearly bought, and the imprisonment of young children in factories is, we consider, far too high a price to pay to enable others to buy their clothing, or any other commodity, a little cheaper.

WE had the pleasure of being present last month at an "At Home" of the Literary Salon at the Grafton Galleries. Here we met several old friends of our earlier journalistic days and made some new ones. The Literary Salon seems to be doing useful work in training students of both sexes for a journalistic, artistic, or secretarial career, and counts among its clients several in the Colonies, including some who required training for acting and stage management. In such cases, Miss Cartwright, the Principal, or Mr. Dixon, the Manager, give the required training by post.

The Use of Lime in the West Indies.

By Prof. Paul Karutz, Industrial Agent of the Cuba Railroad Company.

General soil conditions in the West Indies call for lime, either to neutralize the acidity of the soil or to set free plant-food in it, which Nature intended to reserve. On heavy red soil the addition of lime will be beneficial also to the soil's texture, preventing baking and, in consequence, cracking of the surface during dry weather. To improve the soil's texture is also to improve the dirt mulch, since the surface soil will become better pulverized when the lime has been applied.

Since lime has the power to make the stored-up plant-food in the soil available, it seems to be the cheapest kind of fertilizer; but, and here we must be very careful, repeated applications of lime will draw on the plant-food reserve powerfully, the while adding nothing whatsoever to the soil, and only bettering its physical condition.

Therefore, liming can never replace proper fertilization. The replacing of the plant food withdrawn by crops must by all means follow.

At the present time, where fruit growing in the West Indies is more or less in its infancy, and where the condition of shy-bearing trees can be traced to sour soil and unavailable plant-food, we must start improvements with lime.

There are three kinds of lime that we can use: carbonate of lime, presented in the coral rock formation which underlies many parts of the West Indies; burnt lime, which is calcium oxide, or the coral formation less carbonic acid, which has been driven out by burning; and, finally, calcium hydroxide, which has been formed from the oxide by its absorbing water. This absorption of water we call "air slaking," and calcium hydroxide is usually known as air-slaked lime. When air-slaked lime is exposed to the air for a longer period, it gathers in carbonic acid out of the atmosphere, so changes again into carbonate of lime, resembling, chemically, the coral formation, but, of course, in powdered form. This absorption of carbonic acid always takes place in the soil when burned or air-slaked lime has been applied. Why, then, trouble to burn the lime and drive out the carbonic acid, since such acid combines again with the calcium in the soil, after all?

In fact, it makes very little difference whether the soil receives the calcium in one or other of the three combinations possible; the value lies more in the fineness of pulverization than in the chemical combination. If we powder the coral rock fine enough, we can use it directly on the soil. The final question is, which is cheaper, burning or pulverizing? Burned lime acts quicker and more intensively upon the soil than either of the others. For fruit growing and sugar-cane cultivation, the slower action is more economical.

The molecular weights of the three lime preparations are different, and therefore they must be applied in different proportions to obtain equal results: 100 parts of carbonate of lime are equivalent to 56 parts of burned lime or 74 parts of air-slaked lime. These proportions presuppose chemically pure materials; slight changes in the proportion are occasioned by impurities, such as sand, iron, dirt, &c.

The coral formation, common in the West Indies, is usually soft enough to break easily in a simple stone-crusher with sifter attached; a boll mill will work economically. To apply carbonate of lime in any save finely-powdered form is a waste of money. If mixed with dirt the powder may be applied by means of any drilling or spreading machine.

As to amount applied per acre no definite advice can be given without a consideration of local conditions. A little experimenting on small plots of his land will give the grower the desired information quickly.

In citrus fruit groves I would apply half a ton per acre broadcast, or five pounds about each tree, covering a circle 5 ft. wide, commencing 2 ft. from the trunk. To mix the lime with dirt, by hoeing, is advisable.

If a cover crop has been grown in the grove, the lime should be applied after it has been turned under. Turned-under cover crops (which supply nitrogen) are liable to sour the soil; hence the after application of lime to sweeten it.

Sugar-cane fields will be benefited immensely by applying, per acre at least, a ton of lime. It would pay to conduct systematic experiments on the various soils in the West Indies in different sections, varying both the quantity and the kind of lime preparations used.

There is much yet to be learned as to ways and means of increasing the yield of sugar-cane. It is, however, by no means wise to rely on results of experiments conducted at a distance; experiments should be made right where the knowledge obtained is to be applied.

It is advisable to have near the stables a supply of powdered carbonate of lime, and to sprinkle the powder daily over the fresh manure; it prevents the ammonia from escaping into the air and keeps flies away. To apply burned or air-slaked lime to the manure would reverse the result, as it would help to free the ammonia.

The free use of lime in households is not to be neglected, for lime is an insecticide, a germicide, a deodorizer. Where lime is used there is cleanliness: in homes, chicken-coops, and barns.

Whitewash poured into the nests of ants will convince the most pestered grower that lime is one of the farmer's and fruit-grower's very best friends.

Lime, water, windbreaks, and leguminous cover crops present the best and most economical insurance policy for successful fruit-farming in Cuba. Applied to the raising of sugar-cane, they will easily double the yield per acre of a poor field.

Summary: The use of lime is necessary on the average soil of the West Indies. The supply of coral rock (carbonate of lime) is so plentiful throughout the West Indies that it would pay to open quarries in places along the railroads to supply it to those growers who have not the stone nearer at hand. The general use of lime will result in higher yields, more economical use of manure, and in better sanitary conditions.

The coprah market is steady but quiet. Manila March-April delivery is quoted £20 10s. sellers Marseilles, Cebu March-April £20 17s. 6d. sellers, Java March-May £21 sellers Northern Ports nett, South Sea Islands March-April sellers at £20 15s. Continent and £20 12s. 6d. London.

Fungus Notes.

What the Imperial Department of Agriculture in the West Indies has been doing to call attention to

RUBBER, CACAO, AND COCO-NUT DISEASES.

AMONG the various articles published under the heading "Fungus Notes" in the *Agricultural News* last year were two important publications on cacao canker. The first, by Mrs. A. E. van Hall, in Surinam, attributes the disease in that country to *Spicaria colorans*, though infection experiments with the fungus were unsuccessful (p. 46). The second, by Mr. Rorer, in Trinidad, proved that in that island the disease is due to a species of the genus *Phytophthora*, which is also responsible for black rot of the pods (p. 222). This information, therefore, is somewhat contradictory; but both authors, at any rate, agree that all the species of Nectria which have been found on canker wounds are almost certainly purely saprophytic. An interesting point of local interest that has been noted is the susceptibility of the grafted Alligator and Criollo cacaos to this disease in Dominica (p. 222).

Elsewhere in the *News* the subject of die-back disease is discussed (pp. 46, 270, 382). It has been shown that the causative fungus is the same in Surinam as in the West Indies; and it is almost certain that the allied fungi described on cacao from different parts of the Tropics are in reality identical with one another, and with that found in these islands. The present tendency appears to be to adopt the name *Lasiodiplodia theobromæ* to indicate them all. This fungus also causes brown rot of cacao pods, and is believed to be identical with that causing die-back of Hevea in Ceylon, namely, *Botryodiplodia elasticæ*. Evidence is accumulating which tends to prove that *Lasiodiplodia theobromæ* can live as a saprophyte on a very large number of other plants, and can act as a partial parasite on several, under the right conditions. (See p. 254.) Recent investigations, conducted locally, have indicated that the fungus causing root disease of cacao may also attack limes. A full list of its hosts, and an account of its appearance, are given on p. 366. Some notes on pink disease (*Corticium lilacino-fuscum*) are given on pp. 286 and 382, where its occurrence on pigeon peas is also recorded. On p. 238 appears an account of some experiments conducted in Trinidad by Rorer, to test the effect of spraying cacao systematically with Bordeaux mixture. The experiments indicate that this course is highly remunerative.

A general summary of the diseases of rubber is given on pp. 302, 318 and 334; while a description of pink disease appears on p. 286, and information on die-back on pp. 270 and 382. Pink disease, in Ceylon, is due to *Corticium javanicum;* the causative fungus in the Straits Settlements was identified as *C. calceum*. It is possible that the two fungi are identical in Ceylon and in the Straits. Both are closely related to *C. lilacino-fuscum*. Die-back, in Ceylon, is caused by *Botryodiplodia elasticæ* following the attacks of *Glœosporium alborubrum;* in the Straits it is caused by a fungus which has been identified as *Diplodia rapax*. There is evidence to suggest that *Diplodia rapax* and *Botryodiplodia elasticæ* are the same; and Petch is of the opinion that the latter is identical with *Lasiodiplodia theobromæ*. A new fungus, found recently on Hevea, is *Eutypa caulivora;* its parasitism is, however, somewhat doubtful. It is of interest, since it is closely related to *E. erumpens*—a wound parasite of trees in the West Indies.

A short review of some recently published work on well-known diseases of coco-nuts is given on p. 254; it includes bud rot, root disease and stem bleeding disease; the two former from Ceylon and Trinidad, the latter from Ceylon alone. The root disease in Ceylon has been found by Petch to be due to *Fomes lucidus*, which is often associated with *Botryodiplodia elasticæ*, the last mentioned being saprophytic on the dead roots. In Trinidad, there seems to be a possibility that both bud rot and root disease are of bacterial origin, and due to the same organism; the matter, however, requires further attention.

Our readers will agree with us that the thanks of the planters and others in the Tropics are due to the Department for having collected and published such detailed information on these diseases, just when the question of fungus pests is so much to the fore.

Coming to spraying, the object of this, the *Calendar of the Ceylon Agricultural Society* tells us, is to distribute a poisonous fluid in a finely-divided form over plants, either for the purpose of ridding them of injurious insects, or for checking the spread of fungous disease. It is carried out by means of hand-pump sprayers, knapsack sprayers, or with compressed air and spraying machines of various designs. Where only a limited number of plants are treated, a garden syringe will answer the purpose. In the case of fungous diseases it should be remembered that spraying is essentially a preventive, which to be successful should be applied at the first signs of the disease. Spraying operations are generally best carried out when the foliage is in a moist condition. Emulsions containing kerosine in any form should be used in cloudy weather only, or after sunset.

Dangers of Spraying.—As all insecticides and fungicides are necessarily of a poisonous character, discretion must be used in applying them over fruit and vegetables that will be consumed for food. As the fruit ripens, the spray-fluid should be further diluted, withholding it altogether when it is judged to be desirable to do so. On quickly-maturing vegetables or salads, as lettuce, &c., which are eaten in an uncooked state, it is obviously unsafe to apply any poisonous sprays. Fruit trees should not be sprayed when in blossom, as traces of the poison may become lodged in the ovary of the flowers and thus remain in the fruit.

Insecticides act in two ways, viz., as a *stomach poison* when taken internally by the insect with its food, or as a *contact poison* in the case of insects which obtain their food by sucking, as bugs generally do. Some contact poisons also kill by *asphyxiation, i.e.*, by forming a coating around the insects and thus preventing their breathing; scale insects are affected chiefly in this way. Generally speaking, the remedies for aphis (greenfly, &c.) are in the nature of a *contact poison*, as emulsions, tobacco juice, &c., while for beetles, caterpillars, and grasshoppers *stomach poison*, such as Paris Green, London Purple, &c., are more effectual. Insecticides in liquid form (with water) may be applied by a fluid sprayer or syringe capable of emitting a fine spray or mist that distributes the liquid evenly over the whole plant; while those in the form of powder mixed with lime, dust, flour, &c., may be dusted from a powder-sprayer or bellows, or a thin muslin bag fixed on a pole.

White Ants and Cassava in India.

Cassava experiments carried on in the Punjab (India) show that to be successful: (*a*) Cassava must be planted in the Punjab as soon as the winter frosts are over; (*b*) with a fair supply of water the plant above ground will grow vigorously in the Punjab, but the out-turn of roots obtained so far is very much below what is usually reported as a normal crop; (*c*) white ants are so destructive to cassava between the time the sets are planted and the time they become firmly established, that it is useless to put in a crop without special protection against these insects. For this reason alone cassava cannot be recommended to cultivators in the Punjab at present.

As regards yields, one of the best plots (at Pathankot) gave only 10,978 lb. per acre, against double that quantity (20,000 lb.) reported from Travancore. It seems very hard on the cultivators that something cannot be done to keep white ants at a distance. In spite of every care white ants were responsible for the death of about 70 per cent. of the plants. Full particulars are given in the "Annual Report of the Lyallpur Agricultural Station" for the year 1909-1910, and should be worth careful attention. What seems strange to us is that whilst the cassava is so troubled by the white ants in India, we have heard no complaints from the rubber estates in the East. The *Indian Trade Journal* of December 1st, page 36, devotes its leading article to the matter.

Second Notice.

The Feeding of Crops and Stock. By A. D. Hall, M.A., F.R.S., Director of the Rothamsted Experimental Station. Price 5s. net. Mr. John Murray, Albemarle Street, London, W.

By A. Gordon Howitt, B.Sc.

"It is a proof of high culture to say the greatest matters in the simplest way," and this quotation from Emerson occurs to one's mind after reading the text of this latest addition to agricultural science. In educational books it is often found that they are loaded with scientific and technical terms which only serve to bewilder the average reader, and yet these are sometimes issued with the intention to interest and educate the popular taste. Those writers who have sought to popularize science have been severely criticised by their learned colleagues, and they are experiencing perhaps much the same opposition as was met by the early reformers when they attempted to translate the Bible into the language of the people.

Mr. Hall's position as Director of the Rothamsted Experimental Station has enabled him to embody in his book the results of many of the experiments conducted in the laboratory and on the field, and this book with the others in the same series will supply a long-felt want. Written in a clear, simple style, this book will be of immense advantage to the majority of students of agriculture, who find it difficult to derive full benefit from lectures delivered on any of the branches of this science. It may be an exaggeration to say that it reads just like a novel, but there will be very little tendency to throw the book aside with the terse criticism of "dry," and the student's interest will be engrossed right up to the last page. Perhaps from the student's point of view Chapters II. and III. may be of greatest interest, since the explanation of the work of the leaves and roots is given in a very clear way, and the value of this is enhanced by fine illustrations of the experiments described in the text.

The farmer will also find many points here which he can turn to practical account. It is indeed difficult to pick out any one chapter of especial importance, since each one deals with some points of general interest, but Chapters XII. and XIII. dealing with farmyard and artificial manures may attract the farmer's attention most closely. Here Mr. Hall discusses the intricate question of the conservation of the properties of stable manure, and his deductions on the use of this manure as a fertilizer are very valuable.

And, finally, the colonial agriculturist, no matter under what conditions of climate he may be, will benefit greatly by a study of this text-book. It is commonly asserted that the deductions from experiments in temperate climates are not of much service to the agriculturist in tropical and sub-tropical countries; but though the crops are of course very different, the underlying principles are the same, and if one has a firm grasp of these, then it is not difficult to apply them to special conditions. It seems to be the best policy in view of the high prices of nitrogenous manures to utilize local organic matter and waste refuse as much as possible, and to work them up into suitable forms so as to supply the soil, not only with available nitrogen, but with humus which conserves the moisture—a point of especial importance in tropical agriculture. But as nitrogen mainly tends to the formation of leaf and stem rather than the production of flowers and fruit, this manure must be supplemented with suitable quantities of phosphate and potash manures. Instead then of a soft long-jointed growth susceptible to attack of fungoid disease, the plant develops more uniformly with a greater tendency towards the production of fruit and seed. In this connection Mr. Hall says "Phosphatic manures"—and this applies equally to potash manures—"never give rise to the immediate burst of growth and the dark colour and look of vigour which follows the application of nitrogen; their effect is only to be seen at harvest-time." For that reason the use of the former manures is often neglected, "while nitrogen has been too much employed because its effects are so manifest." All through, the work is carefully illustrated, and it can be warmly recommended to all classes of the agricultural community.

Growers of citrus fruit in our own West Indian Islands, Cuba, &c., should take note of the report just to hand from the *Board of Trade Journal*, stating that H.M. Consul at Jerusalem (Mr. H. E. Satow) reports that great damage has been done to the Jaffa orange crop by a very violent storm which arose on the afternoon of February 10th. It is calculated that oranges sufficient to make 100,000 cases were torn from the trees, while those remaining on have all been more or less damaged.

Vanilla News.

The vanilla crop, its output, distribution, and prospective prices and fluctuations, together with recent legislative measures affecting its use in the manufactories, has been the object of much discussion and criticism of late, and the comments continue without showing any signs of abatement. Our New York contemporary, the *Oil, Paint, and Drug Reporter*, is devoting a good deal of attention to the matter, and has given valuable news of the Mexican output, particulars which are not too easy to secure on this side. According to this authority and other reports to hand, whilst the outputs in Mexico and Bourbon have not come up to the exaggerated estimates at one time current, they have been substantial, in marked contrast to the Seychelles, which seem unable to put forth a full crop just yet, in spite of prospects of improved prices brought about by recent legislation compelling both France and America, if vanillin (synthetic vanilla) is used, to disclose the fact to the buyer. This has had the effect of greatly increasing the use of, and therefore the demand for, the genuine article. We are still awaiting a similar measure to be passed in England, to benefit our own vanilla-producing centres (the Seychelles, Ceylon, Fiji, &c.), and trust that we shall not have long to wait, as such legislation does good to consumers and producers alike, which is more than can be said of some of the enactments that civilization is inclined to trouble us with. Meanwhile, if we lack the law to help the vanilla planters, the syndicate which has secured a dominating influence over the Seychelles crop is having a steadying influence on the London market, and can thus lend aid to France and America in keeping up prices at a remunerative level, and so benefit an important subsidiary industry in our Colonies, for which we have always had a weakness and should be very sorry to see languish. At one time this seemed possible, because even the large manufacturers, judging by our small sales must use artificial instead of the genuine article for making their flavouring from.

Meanwhile, whilst the price of fine long continues to be on a low level, common ordinary beans are selling at a premium, the full range of prices at the March sales ranging only from 13s. for common up to 17s. for picked lots of fine long. In the old days the common was worth perhaps 2s. 6d. to 4s. per lb., and the fine over 30s., but in these democratic days all qualities are valued alike, and were it not that the common qualities were ruling so high, it is doubtful whether fine long would be selling even at 17s. per lb.

At the March sales in London, fair to good Seychelles (or Mauritius) beans realized 16s. 6d. to 17s. 6d. for 8 to 8½ in. of good flavour, and 15s. to 16s. 6d. for 7 to 8 in., whilst common and short, or red and split, sold from 13s. to 15s. per lb.

In August, 1910, Madagascar 3½ to 8 in. sold at 10s. 6d. to 14s. 6d.; Seychelles, 13s. to 14s. for 7 to 8 in., and 9s. 6d. to 11s. for common and split. In 1909 these were worth 4s. 6d. to 8s. per lb., and in 1905 from 2s. (even 1s. 6d.) to 4s. per lb. only.

Quoting the *Oil, Paint, and Drug Reporter* at some length in their notes on "The Favourable Developments of Vanilla," we see that: "The receipt of what may be regarded as fairly definite statistics on the current crop of Mexican vanilla beans would seem to lend further favourable significance to the general vanilla situation. The extent of the 1910-1911 output is given as at least 350,000 lb., of which 300,000 lb. constitute the yield of beans and the balance of cuts. Standing alone, a production of this aggregate might, under usual conditions, justifiably be construed as an argument of rather bearish portent, for it represents an out-turn which has probably never been exceeded in the history of the Mexican industry, and which may fairly be reckoned as a crop of bumper proportions. The nearest approach to it was experienced two years ago with about 300,000 lb. The previous yield was of a more moderate extent, not exceeding 250,000 lb. of beans and cuts. There are several points of consideration which bring the realization of a 350,000 lb. Mexican crop to the favourable market significance to which reference has been made. Of probably most material bearing are the conditions governing the Bourbon situation, while another factor is undoubtedly the fiasco of the extreme predictions made last summer as to the extent of the then approaching Mexican out-turn, running from twice to nearly three times the amount it has in reality reached.

"Estimates on the Bourbon production have also proved extravagant, although not to the same extent as was the case with regard to the Mexican crop. The views on Bourbons went to an extreme at 275,000 kilos, while from trustworthy data available at this time the yield is likely to fall below 200,000 kilos. The practical clearing of hold-over supplies of Bourbons in the French markets by the time the new goods began to arrive placed the markets in an unusually advantageous position and the steady receipts from the producing islands were keenly competed for to supply the hungry home trade. The absorption of the new beans is believed to have been quickened by the enactment of a law in France, similar to our Pure Food and Drugs Act, under which the use of vanillin was discouraged, an influence which is said to have effected an increase of 30 to 35 per cent. in vanilla consumption. The French operators at practically no time since the new Bourbons came under their control seemed to display any unrest over the continued absence of American buying, since our dealers had maintained that the French views were wholly impracticable for the local market on the basis of the prevailing values for Mexicans, and Bourbons gained steadily abroad until at this time the relationship between the two varieties is probably more marked than ever. With the Bourbon crops almost out of producers' hands and well distributed for European consumption, the outlook for any abatement in the position of the Bourbon market during the next few months is not seemingly a hopeful development, and members of the local trade are reconciled to this condition by their dependence upon Mexican supplies. The concentration of selling interest upon Mexicans of both the previous and current crops during the last few months and the apparent appreciation of the ruling market conditions by the curers in Mexico have been the means of establishing prices in the local trade at a marked advance. With the break in values for old supplies toward the latter part of 1910, Mexican beans were sold down to $2 50c., while $2 25c. was acceptable for cuts. The best available figures at this time

are $3 25c. for beans and $3 for cuts with the prospects apparently favouring the maintenance of the upward movement, based on the realization of recent prices in Mexico and the necessity of many of the consuming buyers still to cover their requirements. A limited amount of the cheaper grades of Bourbons is in evidence in the local trade at $3, but the market at this level has little more than nominal significance, as the goods could not be replaced except at a material advance.

"An analysis of the statistical situation of Mexican vanilla minimizes the first impressions that a 350,000-lb. crop might reasonably prompt, if other market factors were not to be considered. Placing it in its most disparaging position, we may add at least 100,000 lb. of the former production which were still to enter consuming channels by the first of the year. A visible supply of 450,000 lb. for twelve months' requirements cannot be regarded as excessive if, as now seems probable, Bourbons remain at a level that keeps them from effective competition with Mexicans. The relatively low level and the availability of freer supplies of the latter have done much to re-establish them in the favour of buyers who during recent years had grown to depend to a greater extent upon the more practical market for Bourbons. The market has been almost cleared of old supplies of Mexican, and a considerable part of the new crop has been engaged, for consuming account. The conditions now governing the production of Mexicans are believed to have been adapted to the marked change in the character of the industry since the entry of Bourbons on such an extensive scale in this country, and with the promise of increasing yields of Mexicans there should be little question as to their right to the old-time trade prestige in this country, but at prices that are reasonably consistent with modern conditions.

"A new element of firmness has been imparted into the vanilla situation during the week, following the Bourbon developments abroad. More interest seems to have been occasioned in this variety for local account, and we are advised of sales of Bourbons, as they run, at a basis that would apparently warrant a spot jobbing level of $3 75c. to $4. Since these operations the French market was reported at a higher level. Holders abroad, it is believed, have seldom been so independent of American buying as at present, and with stocks in France down to a reported level of 40,000 kilos doubt is experienced as to whether they, together with the light supplies still to come forward from the producing islands, will suffice for the European consumption until the next crop can be marketed. The legislation tending to discourage the use of vanillin by compelling disclosing labelling has been an important factor in increasing the sales of vanilla in France. Late advices received in the trade stated that the damage by cyclone to the Reunion Islands, previously reported, was slight, and is not likely to prove a factor in the present situation."

It is with great regret that we have to announce the death of Mr. Philipp Freudenberg. The firm, we understand, will be carried on by the remaining partners, Messrs. Reinhart, Winfried, and Siegmund Freudenberg.

The Cost of Laying Out a Rubber Estate.

The *Rubber World* (London) continues to give its weekly readers useful information on the planting, as well as on the financial side of the rubber-producing world. Among other items of interest Mr. Wicherley's articles on "The Whole Art of Rubber Planting" continues to attract general attention. The following, taken from a recent issue, gives a very good idea of the information these articles contain. Speaking of planting up an estate, Mr. Wicherley says:—

"The preliminary work of marking off the various fields—which should average 40 acres each, inclusive of paths—detaching the areas which are to provide wind belts, and selecting the sites for cart roads, bungalows, factory, stores, &c., must be done before the clearing contractors are permitted on the land, and a clearly marked sketch of the estate made for the guidance of all concerned. In Ceylon, India and the Straits Settlements contracts for this kind of labour may be readily placed with the certainty of getting the work done well and expeditiously.

"Planting contracts and contracts for buildings, &c., must be arranged separately, and be protected by fines for unnecessary delay or non-compliance with the agreed terms. On the other hand, it is always good policy to offer a bonus for work well and duly completed inside the period allowed.

"*Hevea brasiliensis* is best cultivated from 'stumps' and planted 220 to the acre; two important factors which must be taken into account in arriving at an estimate of the ultimate cost of bringing an estate into bearing. The following figures are taken from an estate account appertaining to a property in Ceylon situated nearly eighteen miles from a station and four miles from a Government cart road. It may safely be accepted, in all its particulars as to cost, as a fair example of rubber-planting, as a whole, not only in that island but in the Mid-East generally:—

Contract for clearing and burning (say 460 acres)...	£750
,, roading and draining	150
,, supplying and planting 101,000 Pará "stumps"	2,100
,, factory, bungalows, coolie lines, machinery, tools, and well-sinking	3,750
,, weeding and maintenance—	
Charges first year	900
,, second year	570
,, third year	510
,, fourth year, including coast advances 250 coolies ...	915
Making a total of	£9,645

which is not quite £21 per acre.

"As against this outlay, the estimate of rubber returns for the fifth year (1910) was more than realized. It amounted to 5,120 lb., and sold for 5s. 1d. per lb. net. The estimates for 1911 fix the output at 30,000 lb., the greater portion of which has actually been sold forward at 5s. per lb."

According to the *Agricultural News*, Castilloa rubber is reported to be badly attacked by scale insects in St. Vincent (W.I.), but in the other islands no serious occurrence of these pests on rubber is recorded.

The Late Mr. Hinchley Hart.

IT is with the greatest regret, shared, we feel sure, by everyone interested in tropical agriculture, that we have to report the death of Mr. J. Hinchley Hart, F.L.S., which took place in Trinidad, W.I., last month. After his retirement from the charge of the Botanical Department of the island, with which he had been closely connected for over thirty years, Mr. Hart settled there, and the papers just in by the mail bear eloquent witness to the respect he commanded and the general regret at his loss.

Although sugar men will best remember Mr. Hart in connection with seedling canes, we have always associated him with cacao, on account of the important work on that subject that he published in the early 'nineties, just after our first visit to the West Indies, when there was no book of the sort available. Even to-day we still recommend beginners to secure a copy of "Hart on Cacao." It is true a new and entirely up-to-date third edition will shortly be issued, but even then the original book will be found of considerable value for comparison with the current literature on cacao estates and their management. Written by a man who has lived among the trees since 1875, any of Mr. Hart's suggestions or recommendations deserve careful consideration, even by those who do not altogether agree with them. In the new edition he draws special attention, as he has done on several occasions in the pages of this journal, to the urgent need for growing selected varieties of cacao, and the advantages of a recognized standard of the produce as exported. Like ourselves, Mr. Hart realized that the old method of buying any and every kind of sound cacao, as sent to market, no longer passes as satisfactory among the best buyers, who see through the clay and polish, and realize that hardly any two beans lying side by side are exactly alike. Cacao "to type," purchasable by the hundred tons, is what manufacturers require to-day, and the centre unable or unwilling to provide such cacao will find themselves passed over, or their bids reduced in favour of other centres whose types are well known and recognized. In years past "Cacao Hart" had many strange notions, or was considered to have, but to-day, like the plots of Jules Verne, many have become truisms. His journey to Nicaragua and Central America proved of considerable use to the cacao world, as he brought back to Trinidad new varieties of cacao, with which he started grafting experiments, which, continued by himself and others, have resulted in greatly increasing our knowledge of the possibilities of grafted and budded cacao.

The late MR. J. HINCHLEY HART, F.L.S., &c. ("Cacao Hart")
For many years head of the Trinidad (W.I.) Botanical Department.

The son of a Suffolk farmer, Mr. Hart in 1875 proceeded to Jamaica for the purpose of laying out the grounds around the newly-acquired residence of the Governor of that Colony, which he did to everyone's satisfaction. Whilst in this position he acted as chief officer on the staff of Mr. (now Sir) Daniel Morris, and on the latter being called to assume the assistant directorship at Kew, Mr. Hart acted as head of the Botanical Department until the arrival of Mr. Fawcett (who held the position until 1908, retiring from the Government service in Jamaica in the same year therefore that Mr. Hart did in Trinidad). Mr. Hart then proceeded to take over the appointment of head of the Trinidad Agricultural Department, in succession to Mr. Henry Prestoe (retired). Previous to doing so he travelled in Central America, studied estate management there, paying special attention to Castilloa rubber, and made a collection of botanical specimens, among which several new species of plants occurred. An account of this visit was afterwards published under the title of "A Botanist's Ramble," and attracted considerable attention in the botanical world at the time. When proceeding to Trinidad Mr. Hart travelled *via* New York, reaching that city on board a banana steamer. Mr. Hart retired in 1908, after some twenty-four years' public work, and established himself as a tropical botanical expert in Trinidad. The portrait we publish to-day was taken after his journey last year to the mainland, when he reached as far as Mexico on a visit of inspection.

In the cacao-producing world an authority with Mr. Hart's long practical experience among the trees in various centres will be difficult to replace. We are fortunate in being left, as a legacy, the important works he has published from time to time, and especially the new edition of his experiences and experiments in cacao planting already referred to.

ACCORDING to official returns for 1909, German East Africa exported 5,200 tons (English) of sisal hemp, 1,774 tons coffee, 511 cotton, and 467 tons of rubber.

The Coming Sourabaya Fibre Congress.

We beg to remind our readers that the Java Fibre Congress and Exhibition, to which we have called attention on more than one occasion, will take place from July 3rd to 8th next at Sourabaya, Java.

The aims of the Congress, as of the Exhibition, will be to further the cultivation of fibres in the Tropics, to advise planters regarding their culture, to discuss points on which there is now differences of opinion, to attain uniformity in methods of production and product, and to arrive at a proper insight as to the value of cultivating fibre plants both on a large and a small scale.

The intention is to exclude the cotton culture from the Congress, but not from the Exhibition, as Sourabaya appears to be unfavourably situated for an effective discussion of points bearing on this culture, which in only a few districts in Netherlands India has proved to be remunerative to the natives.

Special attention will be given, on the second day, to the agaves, and especially to sisal cultivation.

Rame fibre will also be only lightly touched on, as experiences with it have been universally discouraging. Coco-nut fibre will not be discussed.

It is unnecessary to dilate on the benefits to be derived from an exhaustive discussion on Manila hemp. The *Musa textilis* is eminently suitable for native culture in the Tropics, but its extension on a large scale is impeded by the fact that its preparation at present is slow and expensive because no suitable machine has yet been introduced to prepare the fibre either on a small or large scale. A discussion on the matter between experts may enable one to be invented.

Further particulars, we believe, can be obtained from Dr. G. Van Iterson, c/ò Technical High School, Delft; or the Secretary, Mr. J. H. D. Wagener, Veenkade 27, The Hague, Holland.

Addresses of Louisiana Sugar Planters and Other Data.

The Louisiana Sugar Planters' Association is at present engaged in compiling, at great expense, a large amount of data concerning the Louisiana sugar industry, and expects to issue it all in the shape of a year book about May 1st. They have two special representatives now going through the sugar district, visiting every sugar plantation to get the necessary information, and the publication will undoubtedly be the most complete collection of data concerning the manufacture of sugar in Louisiana ever published. It will contain the post office address, shipping address, telegraph, telephone, and express station of every sugar factory in Louisiana; the area of land in the plantation, the number of acres in cultivation, the amount of cane grown, plant and stubble, the amount of cane purchased, the total tonnage ground, the amount of sugar and molasses produced, a brief description of the sugar house, and the names of the principal employees. Besides this it will contain by far the largest and most complete list of cane growers ever compiled, giving their names and addresses and the tonnage of cane raised by each, so that those interested can obtain an intelligent idea of the magnitude of each cane growers' operations. The Association is compiling this data to fill a long-felt necessity for prompt and accurate Louisiana sugar crop statistics. The book, when published, will be sold, we believe, for the nominal sum of 6s. a copy, post free, so as to secure a wide distribution for it. Our publishing department has written for a supply and will be glad to receive orders for same pending arrival.

Cork Insulation for Tropical Residences, Rubber Factories, &c.

In "Soil and Plant Sanitation," our Editor makes an entirely new suggestion in urging that corkboard should be used for insulating rubber factories and private residences on estates in the Tropics, in order to keep out the heat, the same as the boarding is being so extensively used in Germany, America, and elsewhere to keep out the cold.

The cork boards could be nailed to the studding, and the surface of the cork covered over with cement. The boards can be moulded to any shape, so that all nooks, angles, and corners will be rounded off; the walls, ceiling, and floorings will thus be of one and the same material, viz., compressed granulated cork covered over with an unbroken surface of cement. The advantages in the way of coolness would be immense, whilst the danger from fire would be reduced. The book mentioned goes fully into the matter, and how the boards can be attached.

Writing on suitable dwellings in the Tropics, Dr. Breinl, of the Australian Institute of Tropical Medicine, supplied the following memorandum in reply to an inquiry from the Editor of the *Australian Sugar Journal*:—

"On the occasion of my journey through North Queensland, I was very much struck by the general use of galvanized iron for building purposes. These galvanized iron buildings do not seem to be suitable for the climate. The inside temperature is very high, if the building is at all exposed to the sun, as the galvanized iron is a good conductor for heat. If cold nights are experienced, the inside temperature gets very low, on account of the same reason. The inhabitants, therefore, are subject to extreme temperatures, as well as great changes of temperature. Wooden houses, with large verandahs, are the ideal buildings for the Tropics, as everybody knows. However, in many instances, great and unsurmountable difficulties, such as high cost of timber and freight by rail and steamer, seem to limit the use of timber as a building material."

We cannot imagine anyone living in a galvanized building that is not well lined, but if cork boards were utilized universally, the extremes of temperatures complained of by Dr. Breinl and others would be reduced to a minimum, whilst, as already stated, greater cleanliness and less risk from fire would be assured. We hope, therefore, to hear more about the matter.

Friends who recently shipped an order for 10,000 hevea rubber stumps for a Scotch firm to British Guiana have learnt that out of 10,300 stumps received (300 being sent free of charge), 10,015 stumps have been passed as growing and doing well. This is an excellent advertisement for Ceylon, where the stumps came from, since the estate has not only all the 10,000 stumps that they paid for doing satisfactorily, but 15 in excess of that number.

"Tropical Life" Friend.—No. 69.

Professor Paul Karutz.

Industrial Agent of the Cuba Railroad Co.

As we have already stated, Cuba has not yet arrived —but it will not be long before it does. In what exact form the boom will be arrayed is difficult as yet to say, but that it will come, and in the near future, is dead certain. Forerunners have already made their appearance in the shape of odd companies and apparently chance articles in the press, every word of which the experienced financier fully realizes has been carefully weighed and thought out, showing that the main body is not far off. Whether the boom will be a success or not will depend entirely on how those engineering it lay their lines (at present they are not laying them at all advantageously), and who the men are that have hold of the reins in the Island itself.

Among the latter, one of the most useful is "Our Friend" this month. No centre can become prosperous without a little—or rather, without a good deal of—law and order in its methods of transport, and of producing and marketing its crops. Professor Paul Karutz means that all these important items shall be run on the right lines, and if there are ever any complaints, that Cuba is not doing as well as she might be, or should be, it will not be his fault. It was quickly recognized, both by the public and the Press, that when the Cuba Railroad established a new department, with "Our Friend" in charge, it had decidedly made a move in the right direction. As the head of his staff, Professor Karutz has to see that those wishing to visit or settle in Cuba are supplied with correct and reliable information about the real facts of the case, and not fanciful pictures to make listeners stand open-mouthed to listen whilst they are relieved of their cash, and only come to their senses to find all their money gone. The railway is right; if Cuba wants not only to draw the right class of settlers but to keep them in her midst, prosperous and contented, they must let the public know the truth. We believe that with Professor Karutz they will do so.

If the railways want regular and increasing passenger and goods traffic (and incidentally the Government regular and increasing revenues), the colonists must be given a chance to be successful and able to produce large and profitable crops. The welfare of the settler, therefore, be he rich or hard-up, well established or just starting, is indissolubly bound up with the prosperity of the railways and the Island itself. Unless all succeed, none will be at their best; and of the three, it is the railway that one naturally looks to for the mainspring of action. The industrial agent of such a railway system, therefore, occupies a responsible position; a great deal depends on him and his powers of organization and initiative, of instantly realizing what is needed, often before the public themselves can tell you, and seeing that it is supplied. We believe Professor Karutz will do all this promptly and adequately; therefore, when the Cuban boom comes along "Our Friend" will probably be found playing a leading part in it, and neither his railway nor the public will be the loser if he is.

We are interested in Professor Karutz because he, in his turn, is interested in crop pests and diseases. We only wish more were like him and as keen and successful in waging war against the San José scale and fungous diseases as he has been. Educated, if not born, in Germany, "Our Friend" has the thoroughness engendered by the German training. By profession originally an agricultural chemist, the Professor has also made a study of the colonization and improvement of rural districts on which subjects he has issued various publications, including his articles in Tropical Life. Those having to do with him naturally find his knowledge extensive and extremely useful. Previous to his appointment "Our Friend" was head of the experiment station at Ceballos, where he carried out fairly extensive investigations into the possibilities of leguminous crops in Cuba, and in working out methods for improving the citrus and sugar-cane industries of the Island.

His past experience is not to be lost under the new appointment, as he is now to establish, as rapidly as possible, experimental farms along the railway tracks, where deemed advisable. There he will demonstrate to the planters what they should grow and how to grow it, thus benefiting the public, and through them, it is to be hoped, the railway traffic. Needless to say, "Our Friend" will be a busy man, he will not pass his time just talking in a comfortable chair at his headquarters, at Camagüey, as depicted above. He has to travel over the lines of the Cuba Railroad, studying the conditions and necessities of each community, and aid the established settlers, not only with advice, and equally helpful information as to what they are doing elsewhere, but to take note of what each colony has for sale and find a market for it, if possible, in other colonies. For instance, if one settlement on the road has fresh vegetables over and above the amount needed for local consumption, he will put that community in immediate touch with some other centre who are short of provisions, and in the market for such produce.

Business Notices.

1.—The address of Tropical Life is Messrs. Bale, Sons and Danielsson, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All **literary communications** should be addressed **to the Editor,** and accompanied by the necessary stamps for their return if not accepted.

3.—All **business communications and payments**, either for subscriptions or advertisements, should be sent **to the Publishers** of Tropical Life. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is **Ten Shillings** per annum, may commence at any time, and is payable in advance.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed to the Manager of the Department.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

March, 1911.

Economies in the Rice Field.

The following particulars are taken from the *Philippine Agricultural Review** and the *Calendar of the Ceylon Agricultural Society*, just published. Of course here we can only reproduce the main points, but our readers interested in rice cultivation would be well advised to look for fuller particulars in the 1910 and 1911 issues of the *Philippine Review* and the *Tropical Agriculturist of Ceylon*.

For lowland or irrigated rice the land should be level to avoid the heavy work and expense of levelling and building dykes. Rice can be grown on almost any kind of land, but a medium loam with about 50 per cent. of clay is the best. Good rice land has generally an impermeable subsoil. The presence or absence of water, and the depth of water in the field, exercises a great influence upon the rate of ripening of the rice crop. Rice is a tender-rooted, shallow-feeding plant. On this account the ground should be worked up well before planting so as to allow the free growth and proper development of the roots which, be it remembered, are the feeding organs of the plant. The surface should not be composed of hard, unbroken lumps, as in such soil the plants cannot obtain a sufficient amount of food. In the case of upland rice, thoroughly preparing the land by means of ploughs and cultivators not only kills the greater portion of the weeds, by tearing them up and exposing them to the sun, but it also greatly diminishes the loss of water by evaporation. The proper preparation of the soil, therefore, enables the rice crop to get a good start. The ploughing does not have to be very deep; as a rule, 10 to 15 cm. (4 to 6 in.) will be sufficient, especially for virgin lands; but for old rice lands, with a rich compact subsoil, deeper ploughing should be practised every third or fourth year so as to bring to the surface some of the virgin soil with its fertilizing ingredients for the crop. For irrigated or lowland rice, have the field well stirred up and brought to a mellow, sloppy consistency at the time of transplanting.

The rice plant does not require a very rich soil; if it is too rich the plant is inclined to develop luxuriantly at the expense of the head. The plant "stools" abundantly, but many of the stalks do not bear at all. In many cases soil conditions, we are told, in the rice fields might be improved by planting velvet beans, or other leguminous plants, as an after-crop. These, whilst alive, collect free nitrogen from the air; when dead, the plants decay and form valuable plant-foods. As pointed out in Tropical Life last November,† in the case of potash, one has abundant proof that when this plant-food is deficient in the soil, the rice plants are incapable of building up the carbohydrates which are indispensable to their life. It is advisable, when applying fertilizers to rice fields, to do so before or during the early growth of the crop.

After plant-food and cultivation, the next important item, especially with lowland or irrigated rice, is the question of supplying water to the rice fields. "The amount of water necessary to produce a good crop of rice," says Mr. Silvero Apostol, who contributed the article on "Rice Growing in the Philippines," "depends especially upon the physical character of the soil and the variety of rice grown. Each grower must solve his own irrigation problem. Some varieties require comparatively little water, while others can only be made to stool and bear well with a liberal supply."

Seed selection cannot be too carefully attended to. Farmers should obtain the best variety of seed suited to their particular soil and conditions. The seed should be selected just before harvesting while the plants are standing in the field. The plants that are to furnish seed should be cut, cured, and thrashed separately from the rest of the crop. Every precaution must be taken to see that the seed is carefully stored until needed, away from damp, vermin and insects.

The seed-bed or nursery must be carefully selected, our Ceylon friends tell us, then well prepared and manured. One acre of seed-bed sown with 2 or $2\frac{1}{2}$ bushels of seed will suffice to plant out about 15 acres. The seed should be sown from three to five weeks before it is required for transplanting. Care should be taken to select the best seeds from sturdy plants. The plumpest can be got at by winnowing. When transplanting it has been found that individual plants develop better than when "bunching" is adopted. Experiments in India, for instance, showed that an acre planted 9 in. by 9 in. with single seedlings may produce practically double the quantity yielded by the usual "bunching" method of transplanting. Planted 9 in. by 9 in. 77,450 plants go to the acre. Whilst transplanting is not suitable for very wet lands, it is particularly well adapted for small fields that are not too swampy, and so, if possible, should be adopted.

* Editorial on the Philippine Rice Crop, p. 621; "Rice Growing in the Philippine Islands," p. 625; "Rice and Its By-products as Feeding Stuffs," p. 664.

† "The Composition of the Rice Plant," p. 211.

Cableways on Sugar and Rubber Estates.

We are glad to see that Mr. Noël Deerr, in his book on Cane Sugar,* gives prominence to the matter of handling and transporting sugar canes by mechanical means, and described the use of cableways for this purpose at some length. With the tendency in the cane-sugar, as with all other industries, agricultural or commercial, for the larger concerns to work cheapest on account of being able to utilize labour-saving machinery and appliances most economically, and therefore to best advantage, it is important for those estates, which still hesitate to adopt these methods, to reconsider their position, and study the cost and method of working approved appliances with a view of adapting them on their own estates.

Leaving out the question of power cane-cutting, by means of circular saws or knives, and even skipping over the matter of cane-grabs which still need to be improved in one or two details to make them as generally used as they should be, what we want to see on the market is an apparatus whereby the cane need only be handled once from the time it leaves the hands of the cutters until it is shot down at the factory by the rollers.

(*By courtesy of Messrs. Bullivant's Ltd.*)

System No. 6.—Another view of Loading Station (Ropeway in Australia), showing 2 cwt. bundles of sugar cane being lifted on to Ropeway.

We believe that we are right in saying that the bulk of the eight or more million tons of cane sugar produced at present (including India) is mostly gathered, stacked on animals, in railway trucks, boats, &c., by hand, to be unpacked again, and re-piled elsewhere, in the same way, before they start on their last journey to meet the Krajewski, or ordinary roller.

What we believe will be adopted to meet this requirement is some system of rope, wove, or linked wire sling, squared at the base with a double flap flooring made to open down the centre for discharging. Such a sling could lay flat on the field when being loaded, but would prevent any loss of cane on the journey. Loaded up they could be run out on wheels along light rail-lines to where the cableway was running and hitched on to be taken down to the factory. Arrived there the flaps at the bottom could be knocked open and the canes dropped on to the platform to be fed to the Krajewski as required. Since starting these notes, we see that *The International Sugar Journal* for March has an important article on the question of the transport of sugar-canes by cableways, with an illustration showing how the loads of canes can be released for lowering into the punts for water-carriage, or on to the platform over the rollers at the mill, as we suggest. The loads would be small, two or three hundredweight perhaps, but would come along in an endless stream so long as there were canes to be ground. By some such means it should be possible to send along at least ten tons of canes per hour, over an apparatus costing perhaps £150 per mile, f.o.b. Liverpool, London, or any English port. A light railway would cost twice that amount, and be more expensive to set up and run, as well as to maintain. Both methods have advantages and drawbacks over each other, but if worked properly with lines judiciously laid across the estates, we believe that cableways, within a radius not exceeding three miles, could be made to transport canes quicker and cheaper to the factory than light railways, and this will certainly be the case when cane grabs can be made to hold the canes after picking them up, as could be done by the use of slings, so as not to drop any in transit. The advantage of the one described with the wooden base or floor is to facilitate emptying, which could not be done so quickly or easily if a chain or rope sling were used.

As the cultivated rubber estates come into bearing during the next five or ten years, and very large quantities of latex or rubber milk have to be collected and sent down to the factory for treatment, planters will be forced to resort to an easy and inexpensive method for transporting the latex by mechanical means that do not need attention on the road. At present this is generally done by hand, and the loss of time occasioned by taking off labourers to carry the pails or other receptacles, instead of remaining at work among the trees, to say nothing of the loss of latex by spilling on the way, must be quite a serious item. For this purpose, therefore, cableways have a great future before them, as by their help either the pails or the covered tanks or skips, into which the pails are emptied as they

* "Cane Sugar: a text-book on the Agriculture of Sugar, &c.," by Noël Deerr, to be obtained of Tropical Life Publishing Department, price 22s. post free.

(the tanks) are pushed up and down from the cableways, by which they could be despatched to the factory without any assistance "en route." On reaching the cableways the tanks could be caught by rings placed at the side, or by other means, and carried along by one line, returning when empty by another. Complaints already come to hand of the scarcity of labourers, whose numbers show no signs of increasing in proportion to the output of the rubber. Each one, therefore, who stops tapping to carry his pail to the factory means a serious and needless loss of time and labour that managers will not tolerate when full pressure of work comes on. We believe, therefore, that in the near future cableways will play as prominent and important a part on rubber estates as coagulators promise to do.

Improved Methods for Indian Sugar Estates.

The *Louisiana Planter* has been doing for the American sugar machinery engineers what we, last month, utilized several pages in this journal in doing for the English firms—viz., calling attention to the efforts being made by the heads of the Agricultural and other Departments in India, to improve the methods employed, first in extracting the juice as well as to increase the percentages of both juice and sucrose contents extracted from the cane.

"It may surprise many to learn," the *Louisiana Planter* very truthfully points out, "that India is the greatest cane-sugar producing country in the world, the country's crop amounting to 4,000,000 to 5,000,000 tons. Notwithstanding this fact, its sugar market has been captured first by the beet sugar and later by cane sugar from Mauritius and Java."

The main cause of our Eastern Empire requiring such large supplies of sugar to augment her own, is that probably for every five tons of sugar that the native obtains, she throws away two on the rubbish heap, or about 40 per cent. Besides this, as we have already explained,* out of the juice itself as much as 20 per cent. of the sugar content is sometimes further lost by fermentation, and over 13 per cent. of the total juice by under-liming; and yet, in this case, as we show, the Mysore cane is an excellent yielder of sucrose, with a low percentage of fibre and glucose; and experimental work has proved that the Indian cane fields and canes can give as good a yield as any producing centre, and better than most.

Iron mills are, however, slowly being adopted; a little enterprise and push on the part of the engineers should cause the advance in this direction to be a little more rapid. What we are especially pleased to see is that machines can be hired for the crop. These tactics will go a long way to improve the demand for the machinery from this side, and to increase the output of sugar in India.

We were unfortunately absent when Mr. W. H. Moreland, Director of Agriculture for the United Provinces, called upon us in London, and have always regretted it, as we know how interested Mr. Moreland is in encouraging the use of improved machinery among the planters, and as about half the sugar-cane produced in India is grown in the United Provinces, such assistance is of the utmost importance. Mr. W. H. Moreland has given much time and attention to the study of the Indian sugar industry, and would, we feel sure, be interested to learn of any new crushing machine which would be adaptable to the needs of the Indian cultivator. It is often through the agricultural departments of the various Provinces that such things are introduced into this country. The Director of Agriculture, Lyallpur, Punjab, suggests the *La Planter*, might also be communicated with, as well as Mr. J. B. Knight (an American, by the way), Professor of Agriculture, Poona."

We hope that the sugar engineers will back up these efforts to improve the demand for their machinery, by willingly helping at the start when the work is heavy, and the profits small, perhaps even as the Irishman put it, "the profit may be a loss." Later on, however, those who will now help are certain to make substantial gains.

*"The Sugar Industry in Mysore," Tropical Life, August, 1907.

Coco-nut Returns.

Lately we have noticed several coco-nut propositions have been floated on this side, and there are plenty of signs that this is but the beginning of a "boom" of this article, on the same lines as the rubber boom, only in a much smaller way. As was the case with some of the principal rubber companies put upon the market, we have had several of these coco-nut propositions submitted to us by intending sellers anxious to know how the public are likely to receive such offers, or to what group of financiers it would be best to apply. Some of the offers were simply outrageous, such as 200 palms and even more to the acre, and annual yields of 200 nuts and over per tree. Such returns are useless, although it seems difficult to persuade the sellers to believe so. A company recently floated published in their report the following particulars, which, being fair average returns, we quote them here as a guide for readers when coming over to sell their coco-nut estates. Fifty trees, planted 30 by 30, are calculated to the acre. The number at this distance (30 by 30) would vary from 48 to 50 at the most, and no well-planted estate, for reasons explained in previous issues, will place them closer than this. The basis of the valuation of the estate was made on the average annual of 50 nuts per tree, of nine years old and upwards, and 40 nuts from palms eight years. This, whilst a fair return, is the full average allowance, although of course many trees do exceed this number. Returns of 200 to 400 nuts per tree in a year are as rare as yields of 10 to 20 lb. of dry rubber per tree. Such returns may be obtainable, but should not figure in a prospectus. It was reckoned that, in Malay, low grass lands would cost $25 (at 2s. 4d. per dollar) to cut, burn off, drain and plant, including the cost of the seed nuts. The importance of proper drainage was shown by the statement that the cause of some dead trees was probably due to the want of drainage. Experiments in the Philippines have proved that coco-nuts will grow away from the sea, in suitable—*i.e.*, loose, light—soil provided there is ample water in the subsoil, placed there either by natural or artificial means, and that this water is in no wise stagnant, but has the same, or as nearly as possible the same, constant ebb and flow about the roots of the palms that they enjoy along the sea-shore.

The Cultivation of Sisal.—No. XI.

The Cleaning of the Leaves.

The Scutching outfit we are about to describe is the product of a good many years' close and exhaustive study by a practical fibre grower in East Africa and elsewhere and the outcome of the most trying and severe tests, which proved that the machine can do the work expected of it. In a day's work of, say, ten hours, claims the patentee, the machine will produce more clean, marketable fibre than any other machine of its type on the market. It will recover a greater percentage of filament contained in any species of fibre leaf, sisal, sanseviera, or others, thus getting the best possible results out of the raw material and showing on the refuse-heap nothing but pulp and bagasse.

This machine known as "The Climax" is constructed on the two opposed drum principle, with automatic feeding and conveyor parts, like practically all types now in vogue, for it is a recognized fact that the old Spanish raspadors, from which this feature was evolved, cannot even now be beaten for efficiency in scutching fibre leaves. But the superiority and efficiency of this machine consists in the simple and practical construction and assembling of the working parts, which preclude side-slips and clogging, as well as undue wear and tear, all of which are potent sources of anxiety and expense, and are the ever-present bugbear of the fibre planter to-day.

Belting for running purposes has been eliminated as much as possible, the control being effected by means of the Heywood-Bridge Patent Friction Clutch, whilst other important improvements is the Conveyor-Chain movement obtained by means of straight-faced and cone and bevel gears.

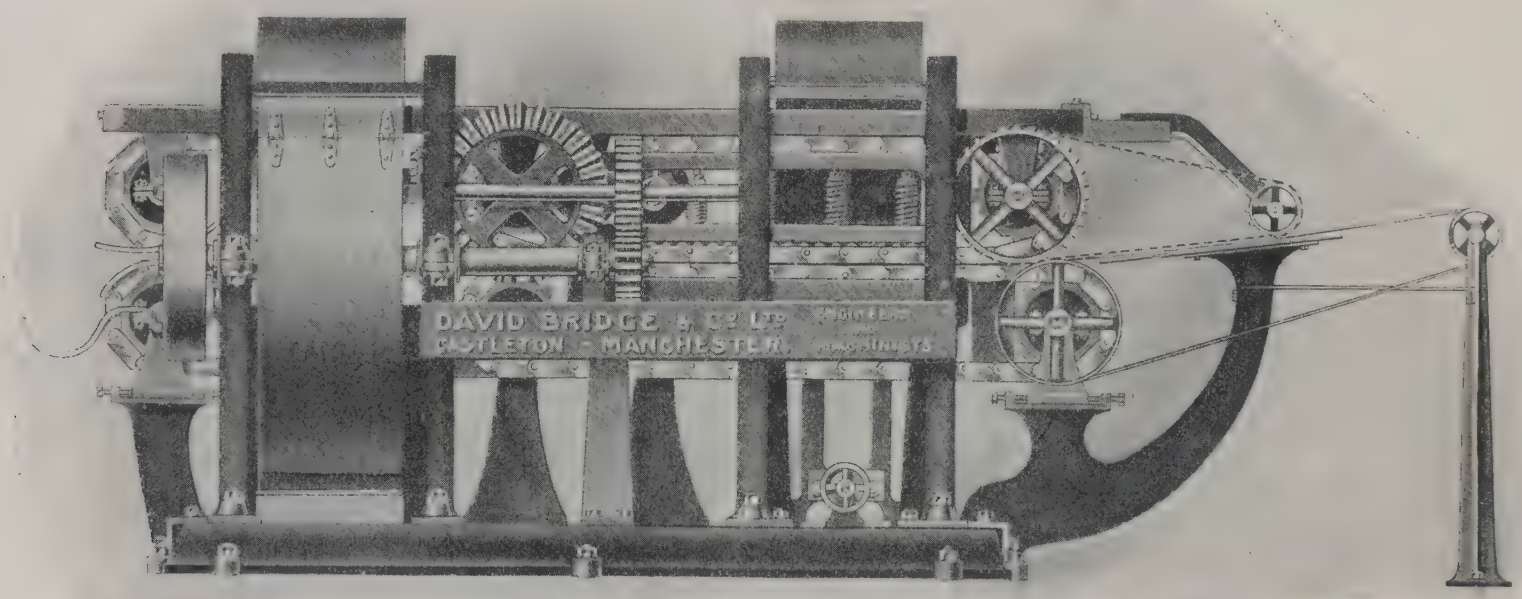
This device is constructed with due regard to the necessary chain-speed to obtain the highest possible amount of output commensurate with perfectly safe and smooth running. It is contrived in the machine body upon proper bearings and frames, well above the line of the leaf-feed and a simple shield of sheet-metal protects it from any possibility of fouling.

Another important feature of the "Climax" is the patented leaf-carry-over-gear, and the over-lap principle, where the second chain *must* grip firmly before the first one lets go, the ingenuity and reliability in action of which are shown in the illustration.

The patent roller carriage, hanging in the same frame in the machine-body, with the holding-down spring-coils, enables both to be removed and replaced in a minute or two for repairs or adjustment. The illustration clearly shows how by means of two or more rolls on one chain-link, an even pressure is exerted on the latter, thereby increasing the gravity which is really the principle of the holding down pressure exerted, which the coil-springs only serve to accentuate.

The advantage of the hollow-bottomed raceway with the frequent trumpet-mouthed down outlets of the machine is obvious. The machine attendant only needs to squirt some water into the races, occasionally, and watch the down outlets, then the machine can be run without stopping. The adjustment of the scutching-shoe is performed by means of sliding rails and two pivot pins on the side. The gripping ridges of the chain-links are the outcome of years of trial and experiment. As now arranged they will hold firmly, and yet allow no leaf to slip through, even if it is only held by a few filaments, and in spite of the heavy corrugations they will not bruise the leaves, owing to the arrangement of the outer shoulders and the special construction of the links in general.

The makers point out that this fibre scutching outfit does not require any outlay on costly steel or heavy masonry buildings, since all over-head transmissions have been eliminated. Any simple shade-roof to suit the locality will do. This item alone shows at times an



The "Climax" Decorticator.

advantage in hard cash of not far short of £250 over the old style.

Turning now to the "Gravity" Leaf Crushing Machine, this does for the fibre machine what the Krajewski cane-crusher does for the sugar roller-mill, and on that account is recommended to all planters of sisal or other fibres.

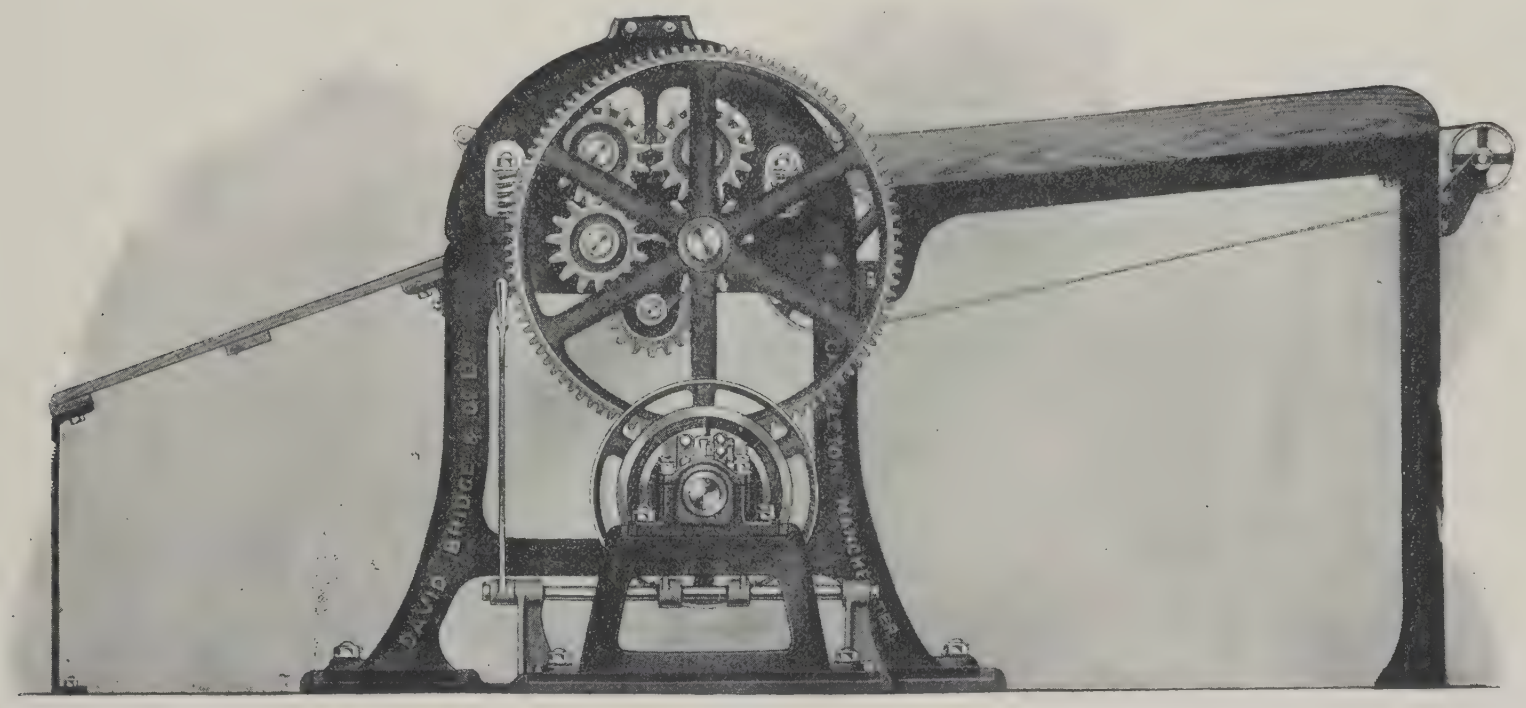
Its construction is both simple and practical, the half-round superstructure, rigidly tied together at the top, bottom and diagonally across, carries the front corrugated and rear smooth upper rollers. The frame proper, with the direct friction-clutch gearing, carries the lower corresponding rollers. The rollers are 8 in. in diameter and 26 in. wide.

The raw material enters over a revolving feed-table of calculated speed, and the corrugated front rollers squeeze it and disintegrate it flat to within the clearance left of $\frac{1}{4}$ in. The rear rollers reduce it still further to $\frac{3}{16}$ in. Should any hard substance get in, or over-feeding occur, the contraction of the coil-springs provided on the steady-bars will increase the leaf-clearance by $\frac{7}{8}$ in. more, or a total space sufficient to guard against any accidents.

The machine known as the "Gravity" Crusher is designed for a speed and capacity amply sufficient to supply one "Climax" Decorticator with "ribbons" for a day and a half.

No other automatic scutching machine will successfully treat unprepared fibre leaves of uneven length or thickness, with the more or less bulky "butts" that are unavoidable, and achieve a tithe of the results it is designed to. The wear and tear, especially at the feed-end is severe with the inevitable result that the life or efficiency of other machines is reduced by at least one half.

The "Gravity" Crusher is designed to deliver the "ribbons" at the revolving feed-table of the "Climax" in regular supplies, so as to enable the scutching gang to do their work without undue haste on the one hand or loss of time through insufficient feed on the other.



The "Acme" Patent Gravity Leaf-crushing Machine.

Rubber Share Market.

Rubber investors have made up their minds that whether Linggis, Vallambrosas, and such-like shares are worth their prices or not, some of the young producers' share-levels are below (in some cases, considerably below) their merits, and they are buying these in a quiet confident way. It is not in shares of this description, therefore, that there is any weakness arising from carry-over difficultes, and, for the rest, a good "shake out" can only make the market the healthier. Meanwhile prices rule as under:—

Alor-Pongsus have a better appearance at $1\frac{1}{4}$ premium, but Anglo-Dutch offer at around 18s. 6d. Anglo-Malays have fallen to 23s. $10\frac{1}{2}$d. Batu Tigas are a trifle off at $4\frac{7}{8}$. British North Borneo Trusts keep hard at about 3s. discount, as do Bukit Mertajams at 3s. $10\frac{1}{2}$d. Bukit Rajahs are down to $15\frac{1}{2}$, but Bukit Sembawangs continue in demand at 6d. premium. Ceylon Parás have been taken by investors at 12s. and over, but are now slightly easier at 11s. 6d. Cicelys are stronger at $2\frac{1}{2}$. Consolidated Malays at 24s. 9d. show depreciation, and Damansaras are weaker at $7\frac{1}{2}$. Dennistowns look firm at $1\frac{1}{2}$. Highlands and Lowlands have been very active, being alternately offered and bid for; they are a trifle doubtful at 5 9-16 at the moment. Kepitigallas are 18s. 9d. bid, but Kuala Lumpurs are only $8\frac{1}{4}$. Lanadrons are unchanged on the week at 5, as are Langkat Sumatras at $3\frac{3}{4}$. Ledburys, too, keep hard at 2 premium. Linggis—the shuttlecock of the market—are practically the sport of bulls and bears, and at the moment do not look too settled at 51s. 6d. Patalings are lower at 3 1-16. Seafields have been sold, and are quoted $6\frac{7}{8}$. Selangors are weaker at 3 1-16. Shelfords are slightly easier at $3\frac{3}{4}$, and Singapore Parás can be obtained at about 6s. 3d. Straits Bertams are 8s. Sumatra Parás are offered at 12s. 6d., and Sungei Salaks at 5. Taipings—mainly on their tin discovery—have been much wanted, and are very firm at 3s. 3d. United Serdangs are a drooping market at 5 1-16, and United Sumatras at 9s. 9d. show to less advantage. Vallambrosas, after much activity, hover around 39s. 3d.

Cotton.

The following were the prices for Cotton in London on March 9th, according to Messrs. Slann and Davies:—

	Good Fair.	Good.	Fine.	Superfine.	Good 1910.	Compare Good 1909.	
	d. d.	d. d.	d. d.	d.	d. d.	d. d.	
Surat kinds* ...	$6\frac{1}{16}$ to $6\frac{13}{16}$	$6\frac{15}{16}$ to $7\frac{1}{8}$	$7\frac{3}{16}$ to $7\frac{7}{16}$	—	$6\frac{1}{16}$ to $7\frac{3}{16}$	$4\frac{7}{16}$ to $4\frac{1}{2}$	per lb.
Madras	$6\frac{15}{16}$ to $7\frac{1}{16}$	7 to $7\frac{5}{16}$	—	—	$6\frac{3}{16}$ to $7\frac{1}{16}$	$4\frac{1}{16}$ to $4\frac{7}{16}$	—
Bengal	—	$6\frac{1}{4}$	$6\frac{1}{2}$	$6\frac{5}{8}$	$5\frac{3}{8}$	$3\frac{11}{16}$	—
Assam	—	$6\frac{1}{2}$	$7\frac{1}{4}$	$7\frac{3}{4}$	6	$4\frac{3}{8}$	—
China	—	$6\frac{1}{2}$	$6\frac{7}{8}$	$7\frac{1}{4}$	$6\frac{5}{8}$	$4\frac{3}{8}$	—
West Indian ...	8	$8\frac{3}{4}$	$9\frac{1}{4}$	$9\frac{1}{2}$	$7\frac{5}{8}$	$5\frac{1}{8}$	—
Sea Island ...	13	15†	19	22	16	8	—
West African ...	$6\frac{15}{16}$	$7\frac{1}{2}$	$7\frac{3}{4}$	—	$7\frac{13}{16}$	6	—
East „ ...	$7\frac{3}{4}$	$8\frac{5}{8}$	$10\frac{1}{4}$	—	$8\frac{1}{4}$	—	—

* Liverpool quotations. † *i.e.* nearly 100 % above the price in 1909.

During the whole of the week (ending March 11th) there has been a want of activity in all departments of the Cotton market. "Futures" are about 11 points lower for positions up to May/June, and 12 for later. The spot quotation has been reduced 13 points to 7.59. Unfavourable reports as to the state of trade are received both from America and the Continent, and all weather conditions seem to indicate a good start for the new crop. East Indian is neglected, although most quotations have been reduced.

The import into Liverpool this week amounts to 61,773 bales, since September 1st 3,533,173, same week last year 47,104, last year's total 2,186,030 bales. The estimated Sales amount to 44,000 bales, including "called" Middling American is quoted at 7.59d. per lb., last year 7.96d., 1909, 5.09d.

Movement of American Cotton since September 1st:—

	1910-11.	1909-10.	1908-09.
Brought into sight	10,355,000	8,662,000	11,264,000
Exports from United States since September 1st—			
To Great Britain	2,929,000	1,706,000	2,895,000
To Continent, &c.	3,179,000	2,753,000	3,532,000
Total crop	—	—	13,825,000

The latest quotations of Americans for delivery, basis middling, any port, G.O.C.:—

	March 9th.	Last Week.	Last Year.
	d.	d.	d.
March	7.39	7.48½	7.76
Mar.—Apl.	7.38½	7.48½	7.73
Apl.—May.	7.39	7.49	7.69

Coffee.

By Messrs. C. M. and C. Woodhouse.

There has been rather a better demand in this market during the past week ending March 11th, and prices generally are fully steady. The offerings at public sale have consisted chiefly of Costa Rica, which met with more inquiry and realized firm rates. A small quantity of East India (Mysore) was about unchanged, and unwashed Dumont Santos realized steady prices. According to Messrs. Düüring and Zoon the stocks in the principal ports of Europe on March 1st show an increase of 3,000 bags for the month against a decrease of 182,000 bags at the same time last year, and the visible supplies are decreased 322,000 bags against 513,000 bags in 1910. "Futures" have been a firmer market, and though a little below the best, latest prices are 4½d. per cwt. higher for the week. We quote:—

		To-day.	Mar. 2nd, 1911.
London ..	Santos, Sept. delivery	47s.	46s. 7½d.
New York ..	No. 7 Rio „ „	10·10 cents	9·89 cents.
Hamburg ..	Santos „ „	52 pf.	51 pf.
Havre ..	Santos „ „	65¼ francs	64 francs.

The receipts at Rio and Santos from July 1st, 1910, to March 8th, 1911, were 9,697,000 bags, against 13,707,000 bags and 11,312,000 bags in the two previous seasons respectively.

Sales include the following, viz.:—

East India.—Mysore at 61s. for smalls, 64s. to 65s. 6d. for middling, 67s. to 70s. for bold.

Jamaica at 58s. 6d. for smalls, 62s. for medium, 66s. for bold.

Costa Rica at 59s. 6d. to 66s. for smalls, 59s. to 64s. for ordinary to fine ordinary, 64s. 6d. to 73s. 6d. for fine ordinary to good middling, 67s. 6d. to 85s. for good middling to fine bold.

Guatemala at 59s. to 62s. for smalls, 62s. to 64s. for fine ordinary to low middling, 65s. to 66s. for bold, 96s. for Maragogipe.

Vera Paz at 69s. to 74s. for fair to good bold.

Mexican at 63s. 6d. for low middling.

Colombian at 63s. to 65s. for bold.

Dumont Santos.—Unwashed at 54s. to 54s. 6d. for smalls, 56s. 6d. to 57s. for medium, 58s. to 59s. for bold.

The India-rubber Market.

By Messrs. S. Figgis and Co.

After being very active at the end of February, with hard fine at 6s. 11d. to 7s. 1d. near and forward delivery, Caucho ball at 5s. 1d., and Plantation kinds up to 7s. for near delivery, and 6s. 6d. to 6s. 7d. October-December delivery, we slackened off by March 10th to 6s. 8½d. for hard fine and 6s. 8½d. for Plantation, although Caucho ball remained about 5s. 1d.

The quantity of Plantation kinds offered at auction on March 14th and 15th was small—176 tons—and prices on the average were 1s. per lb. lower.*

Meanwhile the Pará market has continued quiet, and prices are lower, with sales of hard fine cure, near, at 6s. 6d., forward at 6s. 7d. to 6s. 7½d.; soft fine, spot value, 6s. 1½d.; scrappy Negroheads (Manaos), sellers at 4s. 10½d.; Cametas quiet, value 4s.; Island quiet, value 3s. 8d.; no sales reported of either. Caucho ball, up river, f.a.q. sales at 4s. 11½d., and sellers over; and Tocantin, sellers at 4s. 8d.

At the auctions on March 14th to 16th, Plantation Malay sold: Smoked sheets, 6s. 10d. to 7s.; part smoked, 6s. 3½d. to 6s. 5¼d.; fair to fine unsmoked, 6s. 2½d. to 6s. 4¼d.; damp, pressed and immature, 5s. 7d. to 6s. 2d. Crêpe, fair to fine pale, and palish, 6s. 2¾d. to 6s. 8d.; light brown and grey, streaky, 6s. 1½d. to 6s. 5d.; clean brown, 5s. 10d. to 6s. 1d.; dark brown, part specky, 5s. 8d. to 6s. 0½d.; black and soft, 5s. 1½d. to 5s. 6¾d. Scrap and virgin, fair to good, 4s. 3d. to 4s. 9¼d.; mixed and inferior, 3s. 7d. to 4s. Rambong, crêpe, 5s. 4½d.; good scrap, 5s. to 5s. 3d.

Castilloa.—Soft sheet, 3s. 6d. to 4s. 3¾d.

Ceylon: Sheets, fair smoked, 7s.; biscuits, fair to fine unsmoked, 6s. 2d. to 6s. 7¾d.; biscuits, damp and pressed, 6s. to 6s. 1d.; Ceará, 5s. 3d. to 5s. 7d. Worms, fair pale, 6s. 4¼d. Crêpe, thick, fair to fine, 6s. 4d. to 6s. 9¼d.; fair to fine, pale and palish, 6s. 2¾d. to 6s. 8d.; light brown, 5s. 11d. to 6s. 3d.; dark brown, 5s. 7d. to 6s. 0¾d.; black and soft, 5s. 2d. to 6s. 0¼d.; smoked, 6s. 2d. to 6s. 3½d. Scrap, cuttings, &c., fair to fine, 4s. 3½d. to 5s. 0¼d.; mixed and inferior, 3s. 1½d. to 4s. 1½d.

Mattogrosso.—Good Negroheads sold at 4s. 6d.

Central American and Colombian.—Fair dark scrap, 4s. 5½d. to 4s. 7¾d.; good white scrap, 4s. 6¼d.; tarry roll, 4s. 5d.; very loaded slab, 1s. 6d.

Madagascar.—Washed pressed grey twists, 3s. 7d. to 3s. 11¼d.; mixed rooty slab, 2s. 2d.

Mozambique, Zanzibar, &c.—Manihot clean brown crêpe, 4s. 6¼d. to 4s. 10¼d.; Manihot brown scrap, 4s. 4¼d. to 4s. 6d.; good red Beira ball, 5s. 1¼d. to 5s. 2¼d.; fair red Beira ball, 4s. 6½d. to 4s. 8d.; soft whitish ball, 4s. to 4s. 3¼d.; inferior rooty ball, 1s. 3d.

Uganda.—Biscuits, rather soft, 4s. 5d.; spongy, 3s. 9d.

Tonkin.—Fairly clean ropes, part sticky, 4s. 2d.; soft and porous ropes, 3s. 10d.

Java and Sumatra.—Red crêpe, 5s. 0¾d.

Abyssinian.—Fair sheet, 3s. 5¾d. to 3s. 6¼d.

Pará rubber statistics for the month of February (tons):—

	Pará.	Caucho.	1911.		1910.	1909.	1908.
Receipts at Pará ..	4,690	1,100	= 5,790	agst	4,770	5,040	5,340
Shipments to Europe	2,010	610	= 2,620	,,	2,510	2,070	3,750
,, America	1,230	270	= 1,500	,,	3,000	2,470	1,960
American imports ...	1,200	260	= 1,460	,,	2,390	3,070	1,580

Crop statistics, June 30th, 1910, to February 28th, 1911 (eight months):—

		Pará.	Caucho.	1910-11.	1909-10.	1908-09.	1907-08
Pará Receipts	1910-11	21,770	3,930	25,700	26,970	26,280	24,440
	1909-10	23,030	3,940				
,, Shipts., Europe		9,950	2,730	12,680	12,190	11,880	14,390
,, ,, America		8,910	930	9,840	14,020	13,090	9,140

Tea.

By Messrs. Wm. Jas. and Hy. Thompson.

The feature of the auctions this week, ending March 11th, has been the further improvement in the quotation for fair, common leaf tea which, at the sales on the 6th, touched 8d. per lb., the highest point reached for some years. The grades immediately above, and indeed all teas up to 8½d.—8¾d. per lb., have also moved in sympathy, and latest sales in most instances show a fractional advance. Fine and finest kinds continue in good demand.

The market throughout the week for Indian kinds has again shown a firm to advancing tone for all grades up to about 8¾d. per lb., with improving quotations in many cases among leaf grades. Fair common Pekoe Souchong, which could be bought in a limited quantity at 7¾d. per lb. last week, sold at 8d. per lb., with only here and there a parcel of rough leaf with indifferent liquor to be bought below that figure. Pekoes just above this also reflected the strength of the market, and frequently appreciated a fraction on last prices. Useful liquoring teas from Assam and the Dooars were inclined to harden in value, but thinnish parcels and those deficient in style were hardly in such demand. Flavoury autumnal teas from all districts also sold well, with the exception of some rather reddish and stalky teas. Southern Indian and Travancores sold well at fully late quotations, Brokens with flavour now and again improving in value. The highest averages from the various districts were:—Darjeeling—Thurbo, 2s. 0¼d.; Ting Ling, 1s. 7¾d.; Kalej, 1s. 2¾d.; Turzum, 1s. 2d.; Ambootia, 1s. 1½d.; Murmah and Soom, 1s. 0½d. Assam—Hilika, 1s. 1d.; Pabbojan, 1s.; Beesakopi, 11¾d.; Tingrai and Tara, 11½d. Dooars—Aibheel and Newlands, 10d. The average of sale on garden account was 9¼d. per lb., compared with 8¼d. per lb. in 1910.

The rather smaller sale of Ceylons met with a good general demand, the only weakness apparent being in brokens between 9d. and 10½d., which here and there failed to bring valuations. Quality, in a good many cases, is improving. Finest teas, with really good Ceylon character, were wanted, and came in for strong competition. A few odd lots of roughish leaf sold at 7½d., but speaking generally low leaf tea was dearer; less was obtainable at 7¾d., and a good many parcels which have been selling at 7¾d. and 8d. made an advance of ¼d. Medium brokens were also a rather stronger market, and frequently did slightly better than last week's prices. Good leaf teas were wanted by more than one section of the trade, and sold well in consequence. Good dusts and fannings continue in

* Possibly the small supplies, as is often the case, with the cacao sales, were not sufficient to attract the attention of the large buyers, hence the slacker demand.—Ed. *T.L.*

strong demand, but some of the lowest were a shade easier. The highest averages obtained were:—Udaradella, 11¾d.; Cranley, Glenugie, 11d.; Mount Vernon, Eskdale, 10½d.; West Fassifern, Delmar, Glendevon, Waldemar and Pita Ratmalie, 10¼d.; Tangakelle, Radella, Mahacudagalla, Tillicoultry, Clydesdale, Talawakelle, 10d.; the result for the whole sale being 8⅞d. per lb.; last year, 8d. per lb.

Following the hardening in the market for lower grades of Indian and Ceylon, continued attention has been given to low-priced Monings (China teas), which have been bought both for stock and immediate requirements. Continental inquiry has been practically confined to Keemums from 11d. to 1s. 1d. per lb.

Following a strong and active demand all grades Javas sold freely at fully last rates, with in some cases a dearer market for teas combining good appearance with useful liquor character. The best averages obtained were:—Goalpara, 10¼d.; Panoembangan and Djati Nangor, 9¾d.; Sedep, 8⅝d. For the whole sale on estate account the result was 8½d. per lb., against 7½d. per lb. at the same time last year.

In spite of denials the consumption of China teas continues to make considerable progress in the United Kingdom. Indian teas fairly well maintain their figure, thanks to the excellent campaign being carried on to increase their sales, but Ceylons have gone back, and this should not be, as Chinas have practically doubled their consumption.

Board of Trade Figures for February and for two months ending February, 1909-1910-1911.

Delivered for Home Consumption	1911.	1910.	1909
Indian .. lb.	27,779,200	27,137,400	29,172,500
Ceylon .. ,,	12,869,800	14,493,000	13,877,900
China .. ,,	2,213,600	1,591,700	1,233,000
Java and other Countries lb.	3,249,500	2,806,300	2,682,500
,,	46,112,100	46,028,400	46,965,900

Sugar.

On March 10th Mr. C. Czarnikow considered that Cuba still dominated the market, and fluctuations during the week were based on the various news received. August moved from 10s. 1d. to 9s. 11½d., but on Tuesday the Cuban receipts were considered rather moderate, and Guma cabled that the weather was too dry, which raised the price to 10s. 2½d. Yesterday Guma reduced to 330,000 tons the February production, which according to his weekly totals had been 346,000, and according to Willett 360,000 tons; simultaneously with this reduction a Cuban exporter cabled his own estimate as 1½ million tons. New York prices improved from 3.67 to 3.73 cents (up to 3.80 cents for later April deliveries), and newspapers report that U.S. troops are sent to Guantanamo, Cuba (though no troubles are known), which stimulated speculators here to pay August up to 10s. 7d., closing at 10s. 6½d., whilst next crop moved from 9s. 9d. to 9s. 11¼d.

If only 1,500,000 tons were to be made Guma's cane estimate would be 250,000 tons out, which never has happened before, not even in 1908, and we have no confirmation thereof, though a crop of 1,600,000 tons would require nearly same quantity still to be made as last year. With better quality and improved machinery this should be possible if the weather holds, provided Guma's cane figure is not absolutely discarded. We must leave everybody to draw his own conclusions, but it is instructive to read remarks printed a year ago: "March 10th.—Guma cabled he would have to reduce his estimate considerably. March 17th.—It seems during November-March almost no rain has fallen, canes of last spring hardly made any progress since December, they are reported to be only half size, and if cut at all will make a rather poor addition to the crop. There are various estimates of 1,600 to 1,650 thousand tons."

Probably the low estimate was on the basis of the two provinces which were deficient, otherwise the crop would have been 1,900,000 tons last year. It may be that the same provinces struck this year by the cyclone are again taken as a basis for general estimates, but we are not on the spot, and must let others judge. Larger storing power in the interior is suggested as accounting for Guma's February correction, but that should influence receipts in later months only; at present we must expect that if 330,000 tons become visible in 28 days, we may get more in the 31 days in March, else the 1,600,000 tons total might be questioned, especially if the weather should turn uncertain in April-May.

With August at 10s. 6½d. we seem to have rendered ourselves safe from American orders for some time at least, because that price is equal to about 4.20 cents New York, and no foreign sugar would be wanted till August-September, when probably Javas will have the preference, and can be bought already much cheaper. The Java crop at present promises very well, and some experts calculate that in addition to extra plantings the yield of sugar per acre may be 10 per cent. more. Thus in Java, Formosa, Philippines, Queensland there seems to be over 300,000 tons excess next summer, of which only a part can be absorbed in India and other Eastern markets.

Actual sugar business was done at 9s. 10½d. to 10s. 3d. basis 88 per cent., and 8s. 4½d. to 8s. 7½d. for 75 per cent.

The American market in the early part of the week was dull and easier at 3.67 cents, but has since recovered part of the decline. Cuban Centrifugals afloat sold at 2⅜ cents c. and f. The spot quotation for Centrifugals thus stands at 3.73 cents=11s. c.i.f. for Cubas=9s. 6d. c.i.f. for 96 per cent. Javas=8s. 6d. f.o.b. Hamburg for 88 per cent. nett beet. For shipment in April the quotation is 3.80 cents.

In the United Kingdom business in cane sugar has been very small owing to lack of supplies. Values remain very steady both for grocery and refining descriptions.

From cane-producing countries there is no special feature to report, except that from Cuba printed above. The West India mail reports showery weather in Barbados, favourable for the crops, whilst in Trinidad reaping operations were being pushed ahead vigorously, the weather conditions being satisfactory.

The total transactions for British West India this week amount to only about 2,000 bags. Crystallized Demerara, middling yellow 15s. 6d. to 15s. 7½d. duty paid; Syrups, low middling soft yellow 13s., middling yellow 13s. 6d.

The London Cocoa Market.

By The Editor.

Both the London and Liverpool cocoa markets have assumed a lower and more resigned tone than at this time last month. Grenadas, though selling little or no higher than I quote to-day (March 17th) show less signs of going higher, and Trinidads at the centre of origin have gone back, showing that the international, as well as local, competition at the various centres has slackened off. I do not say that there may not be a rally, but I do not advise prolonged holding, and those estates which ship their crops to London for sale should get over any lots on hand as soon as possible. By doing so, to repeat what I have often said before, your cocoa will be on the spot to take advantage of any rise, or can be promptly sold if prices show an inclination to go lower, and so be able to save a heavier loss. An item that has undoubtedly contributed to the firmness of the market has been the disappointing output at the Gold Coast, the returns to the end of November actually falling behind last year (37,773,000 lb. last year, and 38,025,624 lb. in 1909). Had these been in comparison to the large increase that the centre showed in the middle of the year, we should have had another 20,000,000 lb. available, and there is no doubt that a much larger quantity is produced and could be exported if there were the facilities to do so. The December-February output was heavy, I hear, but figures have not yet been published. Our Board of Trade figures for February showed, I was sorry to see, a heavier decrease (522 tons) than the gain I was able to show for January (415 tons). We are therefore now 106 tons behind last year, bad enough as that was, and no less than 600 tons behind 1909. Compared, therefore, with America and Germany, whose consumptions have substantially increased, we keep going back and back. This is most unsatisfactory. Whether the strenuous efforts now being made by some 200 members of Parliament to get the duty on raw cocoa removed, will, if successful, do any good, remains to be seen; it certainly will not do any harm, and the tax in comparison to the amount collected is costly to collect and harmful in many ways to the development of the home consumption and export. Here are the January-February figures:—

Raw cocoa only—	Landed.	Del'd. H.C.	Export.	Stock (Feb. 28th)
Jan. Feb. 1909—	9,249	4,522	1,095	8,686 tons
,, ,, 1910—	7,256	4,063	1,354	10,679 ,,
,, ,, 1911—	8,531	3,957	1,068	13,272 ,,
	Incr. 1,275	Decr. 106	Decr. 286	Incr. 2,593 ,,

In February only 1,592 tons were landed for home consumption, against 2,114 last year and 2,019 tons in 1909. Landing and deliveries of foreign manufactured, however, continue to increase.

Last month I meant to have given details of the New York imports and consumption to December 31st last, taken from Messrs. Hogins and Lee's well-known returns. A friend, however, borrowed the figures and mislaid them, so I had to wait for this issue to include them. Now at length here they are:—

	Landed 1910.	1909.	1905.	
Guayaquil	90,047	91,025	39,433	bags
Trinidad	125,428	111,459	103,537	,,
Caracas	67,486	72,116	50,743	,,
Surinam	16,672	15,790	12,408	,,
Bahia	60,832	134,780	60,772	bags
Java	11,645	14,759	6,976	,,
Sanchez	122,248	91,640	39,388	,,
St. Thomé	122,552	116,810	91,486	,,
Other African	20,395	14,677	—	
All kinds	681,189	731,714	470,481	,,

	Sales for H. C. 1910.	1909.	1905.	
Guayaquil	85,399	79,047	37,921	bags
Trinidad	125,680	109,564	101,670	,,
Caracas	77,364	65,380	51,953	,,
Surinam	17,729	15,047	11,439	,,
Bahia	64,845	130,348	63,271	,,
Java	10,995	14,486	7,102	,,
Sanchez	119,281	88,055	34,624	,,
St. Thomé	121,753	116,860	89,481	,,
Other African	21,225	13,765	—	
All kinds	685,278	693,780	458,171	,,

The New York stock on December 31st, 1910, was 38,077 bags, against 61,458 bags in 1909.

In connection with the matter of the New York consumption it is worth noting how very heavy the Liverports, which amounted to 109,444 for the two months, pool movements were last month, especially the exsay, January 51,928 bags, February 57,516 bags. The bulk of these probably found their way to America.

The Liverpool "coastwise" clearances were also heavy, and as some returns combine these with exports (*i.e.*, to go out of the United Kingdom), although they may be for Bristol or other ports only, I will give them also: January-February, 30,383 bags, say, January 12,726, February 17,657 bags. Finally, during the two months, out of 141,371 bags landed at Liverpool, only 7,691 bags are returned as going into the country through that port. All the others, except 7,398 bags left in stock, were re-exported in the eight or nine weeks.

Havre, like London and Liverpool, is finding things a little slack after a busy time during the first five or six weeks of the year, and claims that the dulness has been accentuated through the absence of suitable parcels to attract buyers. During February Mons. Alleaume's returns* show that 35,836 bags were landed and 31,028 delivered, raising their stock therefore 4,600 bags, as follows:—

Havre Stock, February 28th —	1911.	Value. Fcs.	1910.	Value. Fcs.
Pará	19,931	68 to 72	18,311	67 to 72
Bahia	32,232	66 ,, 72	22,094	66 ,, 70
Venezuelan	41,510	70 ,, 175	40,875	69 ,, 150
Trinidad	48,836	71 ,, 75	34,839	71 ,, 73
Grenada and other W.I.	6,704	65 ,, 73	6,240	62 ,, 70
San Thomé	16,806	66 ,, 68	13,254	67 ,, 70
San Domingo	3,735	61 ,, 66	12,662	59 ,, 63
Haiti	15,514	54 ,, 57	15,297	51 ,, 64
Accra	24,834	60 ,, 66	17,727	59 ,, 62
Guayaquil	13,979	71 ,, 84	8,399	76 ,, 87
Others	23,382	—	22,584	—
Totals	247,463 bags.		212,282 bags.	

London Stock, Mar. 11th—	1911. Bags.	1910. Bags.
Trinidads	4,928	8,369
Grenadas	14,605	18,454
Other W.I.	5,340	5,624
British West Africa	8,383	5,090
Portuguese W. Africa	8,484	1,116
German West Africa	5,975	1,940

* Which I always quote in Tropical Life, although on referring back I find seldom acknowledge my source.

	Bags		Bags
Ceylon and Java	13,420	..	24,474
Guayaquils	37,139	..	16,975
Brazil and Bahia	1,189	..	1,579
Other Foreigns	11,184	..	11,743
Totals ..	110,647 bags.		95,364 bags.

Our stock, therefore, has increased 25,000 bags since December 31st last, when it stood at 85,930 bags.

According to the latest business done, including the sales of March 14th, prices run as follows:—

Trinidads.—Good middling red, 60s. to 62s., with a tendency to remain nearer to 60s. at the moment.

Grenadas.—Good to fine has been up to 56s. to 57s., but lately buyers do not want to pay more than 56s.; fair fermented, 53s. to 54s.; common unfermented, 52s. to 52s. 6d.

St. Lucia.—Good to fine, 56s. to 57s.; common unfermented to fair fermented, 53s. to 55s.

Dominica.—Fine, 56s. 6d.; fair fermented, 53s. to 54s.

Samoa.—Fine bold at 75s.

Java.—Good to fine bold, 70s. to 74s.; fair to medium, 63s. to 67s. 6d.

Costa Rica.—Good reddish, 55s. to 56s.

Surinam.—Fair reddish, 54s.

West Coast Africa.—Good red fermented is valued at 52s. to 52s. 6d.; fair reddish sold at 50s. 6d. Up at Liverpool about 2,500 bags Accra sorts were sold at 45s. to 49s. 3d., and some Victoria (Cameroons) at 49s. 6d. to 50s. 6d.

San Thomé continue to go into H.C., but no particulars are given of prices paid. Since the beginning of the year some 4,500 bags have been delivered for consumption, and our stock, as can be seen, is now 8,500 bags, against 3,000 bags on January 4th. Fine is quoted in London at 53s. 6d. to 54s. 6d., against 51s. to 54s. last year; and in Havre (mid-March) at fcs. 66-68 against 67-70 in 1910.

Bahia.—Superior sold lately at 58s.; buyers now want to give 56s., but importers so far have refused to entertain such a price.

The crop on the other side continues to be unsatisfactory, with a reduced output and a small proportion of superior. Receipts from April 1st to January amount to only 341,323 bags, against 423,448 last year and 407,696 bags in 1908-9.

Guayaquils.—With the large record receipts coming in (95,800 qtls. to mid-March against 39,400 last year and 70,000 qtls. in 1909) sales are transacted with difficulty and tend to go lower. The last reports show that only small transactions have taken place, including Caraquez at 60s. and Arriba up to 65s. For arrival summer, Arriba has been done at 59s. c. and f., and Epoca Arriba is offered at 56s. 6d. to 57s., but buyers do not seem keen to accept same. Against these, good red Trinidad was quoted at 54s. 6d., and middling red 53s. 6d. c. and f. Havre.

Ceylons continue to realize good prices, especially for fine, say, 73s. to 78s.; fair to good medium and bold, 64s. to 67s.

The London stock on March 18th had increased to 113,000 bags, against 93,000 last year, or 20,000 bags more.

A GRAND PRIZE has been conferred upon Messrs. Burroughs, Wellcome and Co. for their exhibit at the International Hygienic Exhibition now being held in Buenos Ayres.

EMIL PASSBURG, BERLIN,

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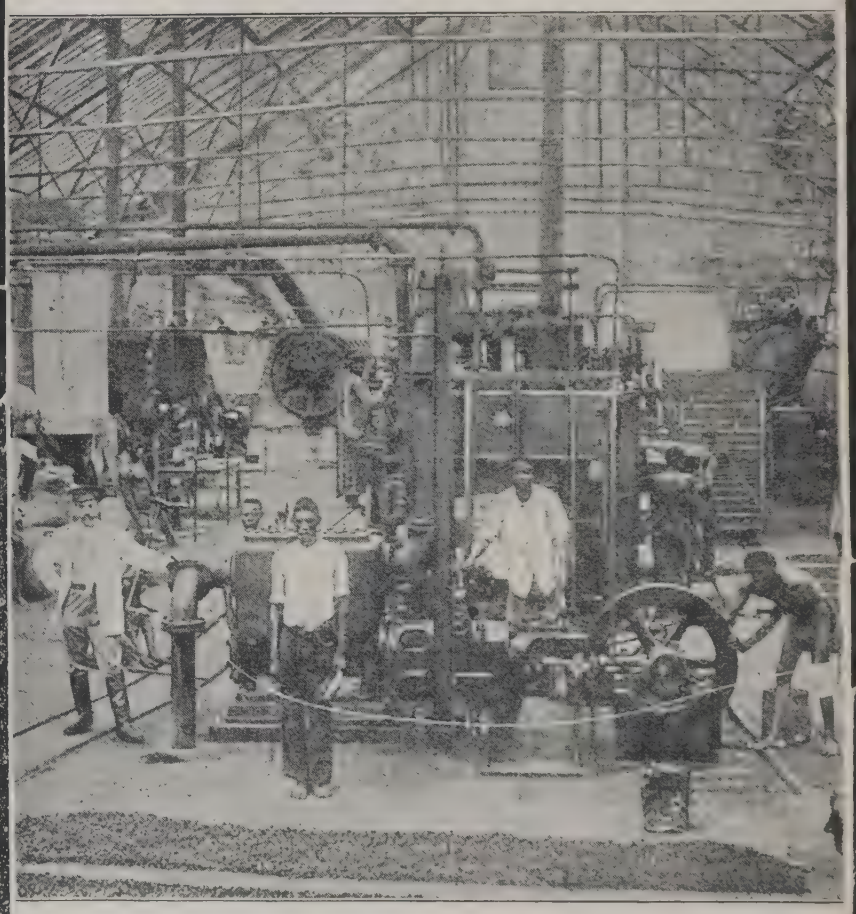

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Tropical Life:

A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

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Reviews of Our New Book.*

THE following include every paper which has up to date had time to review the book. On account of the large numbers it was necessary to despatch to the Tropics for review (68 copies) we only sent to the financial papers on this side:—

The Financial Times.—"The book will appeal with equal force to those interested in rubber or cacao, coconuts or cotton, maize or sugar-cane, tea, coffee, or oil-palms."

The Financial News.—". . . the author brings together the opinions of some twenty or more authorities. . . . The questions of tapping rubber, rubber machinery and cork insulated factories, are exhaustively discussed. The value of the book lies in the collection of facts and opinions by one who is himself an authority on the subject. . . . It should find a wide and ready acceptance."

Mr. F. J. Dunleavy, Manager, Boston-Bolivia Rubber Co., Sorata, Bolivia.—". . . You have got a lot of very valuable information together for the planter in a handy volume that can be conveniently carried or referred to at odd times."

Mr. Wm. Fawcett, B.Sc., F.L.S., ex-Director of Agriculture, Jamaica.—"The synopsis and index are most useful, and quite double the value of the book."

The Financier.—"Mr. Hamel Smith, in his latest volume, discusses a number of topics of prime interest to the rubber investor. . . This is a matter (*i.e.*, the title of the book) which Mr. H. S. will doubtless find time to consider before a second edition of these notes is called for—as called for it undoubtedly will be . . . to dissent from his conclusions (*re* danger of neglecting diseases, &c.) is impossible. . . . The chapters on Ceará and Castilloa cultivation contain a good deal of information . . . and tend to show that, in the case of Ceará, its future as a plantation cultivation is brighter than many people have had reason hitherto to suppose."

The Rubber World, London.—"These notes . . . should prove useful to all practical planters. In the compilation of this practical and useful work Mr. H. H. S. has had the assistance of numerous experts, whose experience has been gained in all parts of the Tropics."

Mons. Gve. Van den Kerckhove, Brussels.—"Your interesting book will be most useful to all rubber and cacao planters."

Industrial Notes and Queries, London.—"The work is full of useful information, as might be expected coming from such a source."

* "Notes on Soil and Plant Sanitation on Cacao and Rubber Estates." TROPICAL LIFE Publishing Department. Price 11s. post free. Pp. 720, with full Index (1236 entries) and Synopsis (14 pages).

The Fifty-guinea Silver Trophy* offered by Messrs. Charles Grenier and Sons, Grenier's "Rubber News," Kuala Lumpur.

To be awarded for the best sample of commercial Plantation Rubber grown in the Federated Malay States, Straits Settlements or Ceylon, exhibited at the International Rubber and Allied Trades' Exhibition. Entries close May 1st.

The figure represents the Goddess of Victory.

* For the *India-rubber World* £1,000 Trophy for Castilloa, see Tropical Life, December, p. 233.

The International Rubber Exhibition, London, 1911.

The "Grenier's Rubber News" (F.M.S.) Silver Trophy.

This Trophy, the value of which is 50 Guineas, will be awarded for the best sample of commercial Plantation Rubber grown in the Federated Malay States or Ceylon.

Rules of the Competition.

(1) Only *bonâ fide* planters of the above countries are eligible to compete for the *Grenier's Rubber News* Silver Trophy.

(2) Samples of rubber exhibited in connection with this competition must have been produced upon the property of, and prepared for the market by, the exhibiting company, firm, or individual.

(3) Exhibits should weigh from 10 to 12 lb., and no lighter sample can be accepted as a legitimate entry.

(4) There is no entrance fee.

(5) Competing exhibits will be brought together in one collection, to be known as *Grenier's Rubber News* (F.M.S.) Competition.

(6) Each exhibit, until the award has been made, will be known to the judges by a number only, after which the names of competitors will be affixed, with remarks, if any.

(7) No contestant may send more than three samples.

(8) The trophy will become the absolute property of the successful exhibitor, and will be presented to him or his representative at the International Rubber Exhibition Dinner, which will be held in London during the currency of the Exhibition.

(9) The exhibit in respect of which the trophy is awarded will be presented by the Exhibition Committee to such institute, or association, or other body, in London or elsewhere, as they may deem best.

(10) It is understood that the judges have the right to test every sample sent for competition, by cutting or by any other method which may recommend itself to them.

(11) Unsuccessful exhibits will, as far as possible, be returned to owners or their representatives at the close of the Exhibition, but, while the directors will take care

to protect exhibits, they cannot accept responsibility for loss or damage arising from any cause whatsoever.

(12) It must be expressly understood by entrants that the decision of the judges is final and without appeal, but should it subsequently be found that the winner has contravened any of these rules, the award will be annulled in favour of the owner of the next best sample.

(13) Entries must be made to the Awards Committee, International Rubber and Allied Trades Exhibition, Limited, at the Registered Offices, 75, Chancery Lane, London, W.C., by Monday night, May 1st, 1911, but letters bearing postmark of May 1st will be accepted and entered as if they had been delivered by that date. All entries should be sent by registered post, or be delivered by hand and a receipt taken for same.

(14) All exhibits for competition must be sent carriage paid direct to the Awards Committee, International Rubber and Allied Trades Exhibition, Royal Agricultural Hall, Islington, London, N., but should not reach that building before June 15th or later than June 20th.

(15) The Exhibition opens on June 24th and closes on July 14th, 1911.

The Gold Medal offered by the Kolonial-Wirtschaftliches Komitee, for services rendered to Colonial economic development, will be awarded for the best process and method of extracting, coagulating, and preparing rubber from the Manihot, Kickxia (Funtumia), and Ficus trees.

The President's Trophy, presented by Sir Henry A. Blake, G.C.M.G., open to the whole World.

The President has kindly intimated that he will present a Trophy for the exhibit proving of greatest interest in connection with the production, preparation, or use of Rubber in any form.

The Association des Planteurs de Caoutchouc have decided that the 1,000 fr. Silver Bowl that they are presenting is to be awarded for the best sample of plantation rubber grown in the Dutch East Indies. The judges will be elected as follows: Two by the Association des Planteurs de Caoutchouc, two by the Netherland Committee, and two by the Rubber Growers' Association, London.

The first sample of plantation Pará rubber from British Guiana has been entered in one of the competitions at the Rubber Exhibition.

The A.I. Root Company's well-known publication, "Gleanings in Bee Culture," looks more attractive than ever in its new and artistic cover. In their issue dated December 15th last, among the large number of illustrated articles was a very useful one on "A Good Method for Removing Honey from Hives in New Mexico (U.S.A.)." A careful and systematic study of this up-to-date journal show how rapidly the scientific culture of bees is spreading throughout the Tropics as elsewhere.

Congratulations are due, we consider, to our contemporary, *The Leader of British East Africa*, for the strides forward that it has made during the last twelve months or so. Comparisons are odious, so we will not compare the copy just to hand to what was received two or three years ago; if we did we should have said that the paper then consisted of four pages only, against fourteen to-day. British East Africa is fortunate in possessing so progressive and go-ahead a mouthpiece.

A contemporary that we note was celebrating its first birthday the other month was *Maillard's Mail*, a little paper run by one of the most enterprising and pushing dry-goods firms in the West Indies. In honour of the event, and of the tenth anniversary of the opening of the present capacious block of buildings that houses the store, known locally as "El Popular," Mr. Maillard, the head of the firm, started for his large staff, both male and female, a free library, stocked with books purchased during his recent visit to this side. Mr. Maillard's signed subscription form was the first one to be received by Tropical Life when we started. Not unnaturally, therefore, we have always taken an interest in the steadily-increasing prosperity of our friend.

The London *Observer* says: "In 'Soil and Plant Sanitation' important points are raised on . . . treating plant diseases. . . . The book will appeal to officials, planters, and investors."

The British West African Association at Dinner.

MR. W. H. LEVER IN THE CHAIR.

WEST AFRICAN interests of to-day were well represented at the Criterion Restaurant last month, when the recently-formed British West African Association held their first annual dinner under the efficient chairmanship of Mr. W. H. Lever, who is, at the present moment, arranging to open up and develop tracts in West Africa, exceeding that of any of the older houses as yet established out there.

(of the Coronation Exhibition), J. Irvine, Chairman of the West African Rubber Company, of Liverpool; H. G. Crellin, of Elder, Dempster and Co.; H. L. Searle, ex-Controller of Customs, S. Nigeria; J. A. Douglas, ex-Director of Education, S. Nigeria; R. W. Mitchell; J. Darnley Taylor (Francis Shaw and Co.); E. S. Salmon, Editor of the *Rubber World;* Dr. Coltman Allen; W. H. Boyle, F.R.G.S.; Stuart R. Cope; T. H. Thatcher; Herbert Underwood; J. Halcrow, F.R.G.S.; W. H. Badams; the Editor of TROPICAL LIFE; and H. Osman Newland (Secretary). After usual loyal toasts, the Chairman proposed "His Majesty's

THE BRITISH WEST AFRICAN ASSOCIATION'S DINNER AT THE CRITERION RESTAURANT.

(1) Mr. W. H. Lever.
(2) Sir Edw. Merewether, K.C.V.O., C.M.G.
(3) Surg.-Gen. Evatt.
(4) Major Tremearne.
(5) Mr. Irvine.
(6) Mr. H. L. Searle.
(7) Mr. J. A. Douglas.
(8) Mr. A. Band.
(9) Mr. E. S. Salmon (Ed. *Rubber World*).
(10) Mr. J. Darnley Taylor.
(11) Mr. H. G. Crellin.
(12) Mr. Herbt. Underwood.
(13) Mr. Stuart R. Cope.
(14) Mr. W. H. Boyle, F.R.G.S.
(15) Mr. J. Irvine.
(16) Mr. W. H. Badams.
(17) Mr. H. Osman Newland (Sec. and Founder).
(18) Mr. Thatcher.
(19) Mr. R. W. Mitchell.
(20) Dr. Coltman Allen.
(21) The Editor TROPICAL LIFE.
(22) Dr. Cuthbert Christy, B.A.

Among those who, besides the Chairman, availed themselves of this happy inspiration of Mr. Osman Newland (the founder and secretary of the Association) to meet together and discuss the best means of organization for doing the work expected of them now, and in the future, were Sir Edward Merewether, K.C.V.O., C.M.G., shortly going out as Governor of Sierra Leone, Surgeon-General Evatt, C.B., Dr. Cuthbert Christy, Major Tremearne (the Hausa Scholar and author), Messrs. Collins Levey, C.M.G.

West African Colonies," and pointed out that whilst great progress had been made in bringing home to the public the value and possibilities of West Africa, what a vast deal there remained to be done. Sir Edward Merewether replied. Major Tremearne then proposed "The Visitors," to which Surgeon-General Evatt responded. Mr. Collins Levey, C.M.G., then proposed "The British West African Association," to which were coupled the names of Messrs. Hamel Smith (Editor of TROPICAL LIFE), and H. Osman New-

land. The former, in replying, urged the necessity of care and organization if the Coast was to be opened up successfully, comparing the work to be done by the Association to that of the Garden City Association on this side, of which both the Chairman and himself were members, when laying out estates for occupation on this side. Mr. Newland spoke most enthusiastically of the future task before them, and was applauded more than once during his speech. After Mr. Halcrow proposed "The Chairman," Mr. J. A. Douglas referred to the great success of this, the Association's, first annual dinner, which was almost entirely due to the energy of their Secretary, and amidst cheers for Mr. Newland, proposed his health.

The Cultivation of Castilloa.

Mexico and Tobago (W.I.) Compared.

For some years past determined attempts, worthy of the success that all engaged in them hope to achieve, have been made to establish Castilloa plantations in Tobago, our little West Indian island, now a dependency of Trinidad, which is generally admitted to have been the real island on which Alexander Selkirk passed his interesting, if monotonous, existence, immortalized by De Foe in "Robinson Crusoe." Whether Friday, as some maintain, came from Trinidad is not quite so certain, but the other Indians, especially those that caused Selkirk anxiety at times, most probably did, judging from the descriptions he gave De Foe.

Be this as it may, Tobago to-day has again come to the front. After being "worked out" by careless sugar-planters, who took everything out of the soil and put nothing back,* the island was having a bad time when our Editor explored it in 1891, and was offered large abandoned estates for a mere song. To-day even portions of these same would require several songs by Melba or Tetrazzini before their owners could be persuaded to part with them, and great credit is due to those who have brought about so welcome a change.

Among the leading spirits in this rejuvenated Tobago is a namesake of our Editor's, Mr. Harry S. Smith, who has, among other things, invented a Castilloa washing and preparing machine, of which Professor Carmody prophesied great things at the Brussels Congress last year. Not content with this, Mr. Harry S. Smith recently paid a visit to Mexico and other Castilloa-producing centres in Central America to study Castilloa planting there, and to compare the methods employed and the variety of tree cultivated.† In the report submitted to the Trinidad Board of Agriculture, we read: "I was pleased to find that these trees were of the same variety of Castilloa as that planted in Tobago, and everything I subsequently saw convinced me that the tree cultivated in Mexico is the same that we have in this colony." In spite of occasional defenders of the old "machete" system of tapping, the report shows the evils of it, old trees that have taken years to come to maturity being killed by such rough usage. "One was sorry to see, here and there, a splendid old tree killed out by this brutal chopping."

In the course of his travels, Mr. Smith met Mr. J. C. Harvey, one of our earliest subscribers in Mexico, and discussed with him the question of "Male Castilloa." "I first saw the *male* Castilloa in flower, and was surprised to hear later from Mr. J. C. Harvey (a pioneer planter and keen botanist) that the greater portion of the plantation trees are non-seed-bearing. It is curious to note that it was here, almost on the northern limit of rubber zone, that I saw *the largest wild trees*. Cross, the botanist, states: 'All the wild Castilloa seen in the forests of Guatemala and Southern Mexico might be described as of medium rather than of large size, and of slender habit, the largest was near Tapachula, with an estimated height of 80 ft. and a circumference of 84 in., 5 ft. from the ground. There can be no doubt that in some of the drier districts of the Isthmus of Tehuantepec and northward, Castilloa shares the reduced size and somewhat stunted growth of the tropical vegetation, which is here approaching the limit of its natural range. On the other hand, it can scarcely be doubted, that in the more southern of the Central American Republics, trees of the Castilloa attain a size unknown in Mexico. Thus, in Nicaragua, Belt speaks of trees 5 ft. in diameter, which yield as high as 50 lb. of rubber, when tapped for the first time.' (*U.S. Department of Agriculture Bulletin*, No. 49.) Seeing what a fine tree the Castilloa becomes under certain conditions,* the wisdom of letting it stand 300 to 1,200 per acre for eight years is doubtful, and for myself, I would go to the other extreme, and apply Mr. Francis Pears's (Lanadron Estate, Ceylon) views concerning Hevea, to Castilloa. 'An acre of rubber with 50 trees is likely to prove more valuable than one with 200 trees.' On reaching San Cristobal de Vega I found that the main crop was tobacco, with coffee, rice, and rubber, as minor industries, and the good quality of the samples of rubber sent to London, from this estate, would be due to the fact that 75 per cent. of the trees tapped are old wild ones, and the rest *over* 14 *years of age*. This estate was only taken over by an English company about a year ago and beyond planting about 10,000 trees 'seed at stake,' little has been done."

Discussing the question of tapping, Mr. Smith reports:—

Seeing that the practice of making long V cuts (sometimes connected with a vertical channel) is universal throughout Mexican estates, I give the following details of some tapping experiments which we made here:—

Tree No. 1.—Age 14 years, girth 48 in., 25 V cuts 16 in. to 18 in. apart, connected with a shallow vertical channel. Length of cuts 12 in. to 18 in. Portion of tree not cut 18 in. Yield 3 oz. dry rubber.

Tree No. 2.—Age 14 years, girth 46 in., 30 V cuts, 14 in. to 16 in. apart.

* Perhaps after all it was not so much their fault. There were no potash or nitrate educational associations, to say nothing of Tropical Life, to teach them otherwise in those days.

† As a countryman and namesake of the writer of the report, our Editor cordially seconds Mr. Harry Smith's vote of thanks to Mr. Hy. C. Pearson, the Editor of the *India-rubber World*, who, he says, "gave me valuable information and letters of introduction which greatly helped me in my work." These little international courtesies are all the more pleasant because they are so willingly given.

* Mr. Smith reports trees 120-156 in. girth at 3 feet from the ground.

Vertical channel.

Length of cuts 16 in. to 18 in. Portion not cut 16 in. Yield 3¼ oz. dry rubber.

Mexican Method.—(Long V Cuts.)

Tapped 6 ft. up the tree only.

Tree No. 3.—14 years old, 27½ girth, 6 V cuts 1 in. to 12 in. apart.

Vertical channel.

Tapped 6 ft. up the tree only.

Length of cuts 11 in. to 12 in. Portion not cut 7 in. Yield 1 oz. dry rubber.

Tobago Method.—(Chisel Cuts.)

Tapped 6 ft. up the tree only.

Tree No. 4.—Girth 26 in., age 14 years, 36 cuts with 1½ in. chisel. Yield ¾ oz.

Tree No. 5.—Age 8 years, girth 36 in., 24 V cuts 15 in. to 16 in. apart.

The last two trees were tapped to compare the chisel system used in Tobago with the Mexican method. Although the chisel cuts gave 25 per cent. less rubber, only 58 in. of bark were incised, against 191 in. excised by the other cutting.

Vertical connecting channel.

Length of cuts 16 in. to 17 in. Portion not cut 8 in. to 10 in. Yield 3½ oz. dry rubber.

Tree No. 6.—Age 8 years, girth 27 in., 17 V cuts 14 in. to 15 in. apart.

Vertical channel.

Length of cuts 15 in. to 16 in. Portion not cut 6 in. to 8 in. Yield 1 oz. dry rubber.

Tree No. 7.—Girth 26 in., age 8 years, 17 V cuts 13 in. to 14 in. apart.

Vertical channel.

Length of cuts 11 in. to 12 in. Portion not cut 6 in. to 8 in. Yield 1 oz. dry rubber.

Coagulation.

We coagulated this rubber with a solution made from the juice of the "moon vine" without creaming the latex.

Range.

The range of Castilloa seems very great, for at Cordoba, lat. 18.50 N. at an elevation of 2,790 ft., I saw two fine trees growing in the beautiful garden of the late Señor Yzguerdo, who had collected a fine selection of plants from all parts of the Tropics. These rubber trees were about 30 years old, with a girth of about 60 in., and bled freely on being cut.

Yield.

Yield as shown by actual experiment from data kindly given:—

Age.	Number of trees.	Yield.	Remarks.
14	1	3 oz.	
14	1	3¼ ,,	
14	1	1 ,,	
14	1	¾ ,,	
8	1	3½ ,,	
8	2	1 ,, each.	

Information from estate books:—

Age.	Number of trees.	Average yield.
6—8	50,000	1 oz. one tapping of estate.
6—7	858	1·2 ,, single day's tapping.
6—7	1,175	·85 ,, ,, ,,
7—8	4,015	2·2 ,, ,, ,,

At La Zacualpa No. 1 about 400,000 trees were tapped during 1910 with an output of about 100,000 lb., an average of 4 oz. per tree. During 1907-08 the average was 7½ oz. per tree. This apparent set-back is easily explained. During 1907-08 only trees of seven years and over were tapped; now it has been found that four-year-old trees can be tapped to advantage, greatly increasing the total output while reducing the average per tree.

Even with this small average yield the gross return for rubber exceeded £20,000 during 1910, and this with only one-fifteenth of the trees producing.

At Sanborn I spent a few days on the La Buena Ventura (Mr. Harvey's) property, here we lightly tapped a few eight-year-old trees to obtain a sample for comparison by analysis with Tobago rubber. After coagulating with the moon vine, the rubber was cut into narrow pieces and passed several times through a small mangle, making a very strong, long strip about 3 in. in width. These strips are tightly wound to make a disc of about 15 in. in diameter; about ten of these discs bound together by similar strips, when packed in matting and sewn up in an outer cover of bagging, make a good and cheap package for export, two being carried on mule back.

Here we were unfortunate in having two wet days, so I could not see much of the estate. Last year Mr. Harvey tapped 50,000 trees, and he was about to start tapping again.

Elsewhere the planters were found busily engaged in putting up tanks and centrifugal machinery for handling rubber on a large scale.*

Diseases.

On the whole, the Castilloa tree in Mexico is singularly free from disease. I did not see a single case of "Collar rot" which attacks it in the West Indies.

"Die back" is fairly common in some places, but where it is not due to actual poverty of soil or to the effect of strong drying winds, it has been found to be amenable to treatment.

One large area was pointed out to me, where by cutting 3 ft. drains every 36 ft. an apparently hopeless piece had been brought into splendid condition. And where the soil had been baked and the roots injured by hoe weeding, by simply letting everything grow up for two years to shade the ground and trunks, a complete recovery was made.

Canker will have to be most carefully watched on the Atlantic side with its humid climate. In certain districts I saw fine trees killed by it; but the long dry spell of the Pacific slope seems to keep it in check. Even here there was serious damage, but I did not see trees actually killed.

* We were recently shown in London large samples of both Hevea and Castilloa said to have been coagulated by centrifugal machines, and must say that the nerve and quality left nothing to be desired.

Banana Planting News.

On account of the depression caused by the "Witch-broom" disease in Surinam, the Gros Michel banana was introduced and a considerable area planted. Now we hear that the bananas have been attacked by what is known as the Panama sickness, which is causing great havoc on the estates. As strenuous efforts to stamp out the disease proved unavailing, the Board of Agriculture introduced the Congo variety, which was found to be immune to the disease; and it is anticipated that the Gros Michel will now be abandoned in favour of the Congo.

We see by the *Australian Sugar Journal* that the Department of Agriculture in Queensland has issued a third progress report from Mr. Brunnich on the banana manuring experiments at Buderim Mountain. The various plots have now passed through the winter season, which is the real testing time. The winter was an exceptionally mild one, and the appearance of the experiments on the southern end of the mountain had been regarded as rather disappointing, as the majority of first bunches would not mature, being "blind" bunches. This is particularly the case in the unmanured and lightly-manured portions; but even in the heavier manured plots the results are not so good as was expected from the healthy appearance of the suckers in May.

Results on the experimental field at the northern end of the mountain were far more promising. The difference between the unmanured, lightly manured, and heavily manured plots were striking, and only the former showed a notable percentage of blind bunches. On the plots which received double weights of manure the health of the stools was very apparent, and the yield and size of bunches was quite as good as could be expected for a first crop, even from fair quality new land. The stools suckered well, and the number of second suckers average about two for each of the stools of the manured plots, but about one and a half, and only weakly ones, for the unmanured plots.

The results show clearly that only the double amounts of manure seem to give sufficient stamina to the stools, and that in the case of a more severe winter the difference between the experiments would have been much more marked. In order to make the experiments successful it is absolutely necessary that the experimental stools receive another dressing of manure, to be applied at the end of the rainy season in February or March, to carry them over the winter.

It appeared that some of the land on the southern end was in an extremely exhausted condition—even weeds would not grow properly on it. It was more exposed to the cold winter winds and appeared to contain less moisture than the soil of the other block. Mr. Brunnich considered it very necessary to shelter the soil in the first experimental block, by growing a leguminous crop between the rows, and mulching the stool with parts of this crop. The labour necessary to keep the crop clean would thus be greatly reduced, and the soil itself protected.

A second series of experiments has just been planted in each of the two blocks. All the experiments, with two exceptions, will have the same amount of manure —namely, 160 lb. potash, 80 lb. phosphoric acid, and 40 lb. nitrogen per acre. In addition, one half of the experiments receive at the rate of 2 tons per acre of lime and some of the rows also 2 cwt. per acre common salt. These second manurial plots will also be mulched with green manures grown on an adjoining piece of land. It is also proposed that these plots shall receive a second dressing of manure in February or March. The principal object of this second set of experiments is to ascertain the manurial value of nitrogen. Nitrogen in the form of ammonium sulphate appears to be the least suitable for banana cultivation.

By experiments carried out the superiority of the Governor variety of banana under local conditions for Trinidad (W.I.) have been clearly established, and the difficulties at first experienced in shipping this variety have been overcome.

Another important fact has been established in that Island, reports the Director of Agriculture, Professor Carmody, viz., the suitability of pen manure for the growth of bananas. All the Trinidad soils are deficient in organic matter; and a dressing of pen manure at the rate of 40-50 tons per acre has produced very satisfactory results as shown in the report.

The raising of stock in conjunction with banana cultivation is therefore very desirable if not absolutely essential; and the absence of live stock from the cycle of farming operations has frequently been referred to by me, reports Professor Carmody, as one of the weak points generally in tropical agriculture.

From the results now published it appears probable that a profit of $200 per acre may be expected from the intensive cultivation of bananas under present conditions and prices if an adequate dressing of pen manure is available at a reasonable cost. The cheapest method of obtaining pen manure is from pens on the cultivation, and with a supply of green fodder within reasonable distances a small profit on the stock might also be expected. Experiments are being made with a continuation of pen and artificial manures with a view to lessening the cost.

The efficiency of the cold storage arrangements on the Royal Mail steamers has been conclusively proved over a sufficiently long period, and there are now no less than fifteen records within a year of the sales amounting to 100 per cent. of the shipments, and on the total for the year the sales have amounted to 98½ per cent. of the shipments, showing only 1½ per cent. of loss in transit. Growers of bananas have therefore only this small possible risk of loss on the shipments to allow for.

Making allowances for all reasonable risks in connection with banana growing a satisfactory profit should be expected at the present price of the fruit.

"Maize, when freshly gathered," the *Journal of the Jamaica Agricultural Society* tells us, "contains as much as 16 per cent. moisture, which needs reducing if the corn is to be kept. American corn, as sold in Kingston, contains, as a rule, only 12 per cent. Planters in Nigeria are investigating mechanical dryers with the view of adapting one or other of the most suitable machines for the large output of maize that Colony is now producing. We have recommended that a rotary dryer be used.

Labour Conditions on Mexican Rubber Plantations.

By J. L. Hermessen.

During the past year a series of articles have been published purporting to represent the true state of affairs in respect to labour conditions on plantations in Mexico. The picture drawn by the author of those articles was such as to compel a formal protest from the Society of the American Colony in Mexico City, as being a grossly unfair and libellous attack upon Mexico and things Mexican, calculated to injure American interests in that Republic, and to disturb the good relations existing between the two countries. Without entering upon any critical examination of the wholesale exaggerations of the writers referred to, it may suffice to say that, were a foreigner to visit England, limit his observations to the worst slums of the East End of London, and then give forth his views on social conditions in England, founded upon such data, the result would not be farther from the truth nor more manifestly unjust than was the story of "Barbarous Mexico."

In my own personal experience of tropical Mexico, embracing some seven years, I have encountered no single instance of ill-treatment of plantation labourers; and I venture to say that on many large properties with which I am acquainted the care taken of the men in their employ is, in every sense, exemplary.

On a large rubber estate on the Isthmus of Tehuantepec, with which I was connected some five or six years ago, when there was much activity in planting in Mexico and a consequent urgent demand for labour, we had several hundred men under what is called the "enganche" system. This is, in effect, a sort of indentured labour, subject hitherto to but little governmental control; but some new enactments have lately been passed, providing for more direct official regulation of the traffic. The men of whom such a force is constituted are collected from all parts of the country (often including in their ranks the riff-raff and scum of the larger cities) by labour contractors, who, in return for advances of money, exact service for a length of time equivalent to the amount of the indebtedness. These men had to be kept under strict surveillance, or they would decamp and so evade their obligations. They were housed in specially-constructed "galeras," or sheds, sufficiently protected against the weather, and situated within fenced compounds, which—for the reason above mentioned—were constantly guarded. But they were *not* badly treated. They had plenty of substantial, if coarse, food, and received all necessary medical attention when sick, each camp being regularly inspected by a qualified physician attached to the estate.

The same system still obtains, but, with the present reduced demand for labour, on a relatively small scale. It has been mostly superseded by the organizations of experienced *agricultural* contractors (in contradistinction to *labour* contractors), who have gathered together superior bands of able-bodied labourers from the various planting districts, composed of men who have been accustomed all their lives to machete and axe work, and who are thus thoroughly expert in the use of these tools for all plantation needs; and, on such estates as favour development by means of contract work, this is the class of labour now generally adopted. Naturally it is more expensive, as it is more efficient—individually and collectively—than the labour of the "enganche" system.

The question of importing foreign labour for agricultural purposes in Mexico has frequently been debated, and upon different occasions proposals have been formulated to this end, and some have ultimately been consummated—both Chinese and Japanese having been tried, but, generally speaking, with no very conspicuous success. Amongst planters in Mexico, as a body, the feeling is that the native element, properly handled, is as efficient and satisfactory as can reasonably be expected or desired. But to bring your Mexican Indian up to the scratch implies much understanding, much patience, and, above all, a certain psychological *finesse* (defying abstract definition), in which the wisdom of the serpent is combined with the harmlessness of the dove. Ability to handle labour is now rightly regarded as amongst the most important qualifications of an estate manager in Mexico. Trite and self-evident as this observation may appear, the fact, *per se*, was, until comparatively recently, ignored, and men possessing neither knowledge nor discernment in this respect were frequently placed in positions of executive responsibility, with the inevitable result—chronic trouble with their men, entailing correspondingly disastrous effect upon the general *moral*, as well as upon the practical and economic operations of the estate.

But to revert to the particular point at issue, if there have been cases of abuse of plantation labourers in Mexico, as can perhaps not be denied *in toto*, since Utopian conditions are not claimed for this country, it may, on the other hand, safely be affirmed that such cases have been exceptional and isolated; and it may also be added that, where proved to have occurred, they have been confined to the acts of individuals (usually the foremen in charge of field gangs), and certainly have never originated under the immediate authority, or with the acquiescence or cognizance of either planters or planting companies.

Referring to the attacks on the Mexican Government for allowing what is alleged to be slavery on the sisal and other estates, we see that Mr. John Kenneth Turner, one of the adverse critics of the Diaz rule in Mexico, has issued his version of the state of affairs in book form, under the title of "Barbarous Mexico." According to Mr. Turner, the Yaqui Indian prisoners of war are not the only persons sold to the planters. Slavery for debt is said to be common. It seems that Mr. Turner visited Yucatan in the guise of a wealthy American desirous of purchasing plantations, and he claims that owners of the land thus gave him fullest confidence, and did not attempt to hide the fact that they were using, wholly or partly, slave labour. The London *Standard*, in their review of the book, echoes our own sentiments. "Greater moderation," they say, "would have carried greater conviction . . . . the general view of Latin-American critics from other States is that Diaz has shown great qualities as a ruler, and that the advantages accruing to the country from his stern rule altogether outweigh the defects of his system."

Besides Mr. Bankhardt's and Dr. Thomatis' (both residing in Mexico) protests, published in our February issue, we have received one from Mr. Hermessen, published this month, and a very important communication on the matter from the Camara Agricola, of Yucatan. We are reviewing Mr. Turner's book at some length next month, and would advise those who consider that the charges are untrue, to secure a copy and study it carefully. The book certainly calls for an answer.

The Cultivation of Cacao, No. XXII.

Shade and Manuring.

According to the Report of the Cie. of Kasai (p. 10), when discussing the question of shade or no shade for cacao, experiments made in the Dutch colonies tend to show:—

(1) That cacao trees can very well be cultivated and even give larger yields without shade (en plein soleil).

(2) The great advantage of shade trees lies in the improvement they give to the condition of the soil in equalizing the temperature, in preventing the erosion of the humus, in keeping *in situ* the humus provided by the trees, in keeping the soil open, and increasing its nitrogen content. They also act as wind breaks, prevent erosion of the humus and top soil, especially on the hill tops and sides.

(3) If, therefore, the cacao is grown without the shade interplanted, it will be necessary to obtain the advantages pointed out above by other methods. This would include an increased use of manures, more cultivation, and a free use of green manures, especially leguminous ones to supply nitrogen.

(4) The planting of cacao, therefore, without shade, means the adoption of more intensive methods of cultivation at a great cost to the owner; the returns, however, would also be larger.

(5) At the same time local conditions, the nature of the soil, its surface conditions, whether hilly or flat, the labour available, cost of manure, whether dung, artificial, or green crops, must be considered.

As regards the necessity of supplying cacao trees with manure, the Kasai report is emphatic and quotes the following estimate of Mons. Bonâme, showing the proportions of the plant foods removed from the soil by each 1,000 kilos. (or ton) of dried cacao shipped. We add the third column to show what is lost to those estates that do not make full use of the manurial value of the empty pods:—

	Dried cacao as shipped.	Pods and contents as picked.	Leaving for return to the soil by empty pods.
Phosphoric acid	6·348	9·142	2·794 kilos.
Sulphuric acid	1·080	4·191	3·111 ,,
Lime	·934	5·100	4·166 ,,
Magnesia	3·118	8·205	5·087 ,,
Potash	9·697	57·539	47·842 ,,
Nitrogen	16·240	26·000	9·760 ,,

Professor Wohltmann's experiments at Victoria (Cameroons) is then quoted, and as the Cameroon crop is slowly but surely jumping from 50,000 to 100,000 bags, it is well to note that suggestions as to how the exhaustion to the soil that such a crop (equal to 3,000 to 6,000 tons of dried cacao) brings about, can, year by year, be restored.

The cacao, it must be remembered, is the rather harsh flavoured *amelonado* description, bitter when fresh, and (in the case of the Cameroons) "hammy" when cured, unless great care is taken when sweating the cacao. At the time of writing some 1,300 bags of this cacao, declared to be free from any suggestion of "hammyness," sold at 53s., against 54s. to 55s. for fine Grenadas. These disadvantages could, however, be improved, perhaps out of existence, or nearly so. The late Mr. Eugene Masson, of Trinidad, maintained, and we think he was right, that the *Calabacillo* variety of *Th. Cacao* was nearest to the wild cacao, and many claimed that such "stuff" was not worth cultivating. Grenada, however, used, we believe, little or no other kind, and certainly those who remember the beans in the early 'eighties agreed that the quality was not magnificent. Care, cultivation, and plenty of plant-food have, however, improved the cacao crop of Grenada out of recognition, until to-day, *whilst still maintaining the free-yielding quality of the original Calabacillo*, the crop is a prime favourite and sells, all things taken into consideration, at a higher nett price per producing acre than any other centre.

This is entirely due to the Grenada planters and their advisers, and we consider they deserve the highest praise for the example they have set others, not forgetting Trinidad. If Trinidad had done as well the Empire would have been several millions richer than she is to-day, and even if the money were thrown away (?) on "Dreadnoughts," we would have had the pleasure and profit of spending the money, instead of letting canker and other pests eat it up to the advantage of nobody, not even of the makers of spraying machines and fluids.

Coming back to the Cameroons and the cacao-manuring experiments undertaken out there by Professor Wohltmann, these were carried out in the following way. Eight plots were marked off, one being left unmanured, whilst the remaining seven received per tree the following mixtures, portioned out thus:—

	Gr.		Gr.
(1) Lime	1,009	(4) Kainite	1,000
Kainite	1,000	Sulph. of ammonia	240
Superphosphate	480		
Sulph. of ammonia	240	(5) Kainite	480
		Sulph. of ammonia	240
(2) Kainite	1,000	(6) Lime	1,000
Superphosphate	480	Kainite	1,000
Sulph. of ammonia	240	Superphosphate	480
		(7) Lime	1,000
(3) Kainite	1,000	Kainite	1,000
Sulph. of ammonia	480	Sulph. of ammonia	240

One of each of these mixtures were applied to every tree on the seven plots, and then their yields compared with the eighth and unmanured plot with these results:—

Yield per year per tree.	Green cacao beans.	Dry beans.
No. 1, mixture or plot	4·376	1·724 kilos
,, 2 ,, ,,	6·127	2·414 ,,
,, 3 ,, ,,	5·381	2·120 ,,
,, 4 ,, ,,	3·741	1·473 ,,
,, 5 ,, ,,	4·464	1·758 ,,
,, 6 ,, ,,	4·488	1·768 ,,
,, 7 ,, ,,	5·395	2·125 ,,
Unmanured	1·666	·656 ,,

In face of these results no one can deny that it pays to "feed" the trees.

"Tropical Life" Friend.—No. 70.

Mr. H. Osman Newland, F.R.Hist.S., F.S.A., &c.
Founder and Secretary of the British West African Association.

"Our Friend" this month has been prominently before the tropical agricultural public of late on account of the plucky stand he made in connection with the Christineville Company. As Chairman of the shareholders' Committee of Investigation, Mr. Newland eventually succeeded in forcing the vendors to sign a contract to repay part of the purchase money into a guarantee fund to ensure a dividend for three years, and to plant some more rubber trees. As a result of this spirited action, and on account of his knowledge of rubber generally, Mr. Newland was invited to become a director of the company, and it is generally agreed that the shareholders cannot fail to benefit by his presence on their board; certainly no other member has greater faith in the future of West Africa generally as a producing centre than does the subject of this sketch. It is on this account that Mr. Newland was induced to agitate for the formation of a British West African Association, to look after the interests generally of those who had invested money, either as private planters or traders, in mines, timber, rubber, or other companies on the Coast, to give them practical and reliable advice regarding the prospects of the various industries, and by eliminating the undesirable promoting speculator and opposing those who wish to restrict the Coast trade and thus to help open up this fertile colony to the commerce and trade of all pushful Englishmen. As it is, those who now dominate the Coast have so let in the foreign element, that in an excellent lecture, delivered lately, reference was made to this matter, and the B.W.A. Association has caused attention to be called in the House of Commons to the way foreigners are being allowed to monopolise a trade that should be peculiarly British. We believe, therefore, that, whilst giving everyone with enterprise and push fair play, we shall hear a good deal in the near future of the B.W.A. Association and its pushing secretary, whose portrait is found at the head of this article.

Educated at Counter Hill Collegiate School, Mr. Newland passed from there to the City of London College, and then to that most excellent educational centre, the Goldsmiths' (Company) Institute. Whilst still quite young—that is, when about 18—"Our Friend," with Colonel Maude, V.C., C.B. (the Mutiny hero, and afterwards Consul-General at Warsaw), and Mr. (now Mr. Justice) Darling, established and pioneered the Goldsmiths' Institute Literary Society. Later on "Our Friend" travelled extensively, filling in odd moments with his favourite recreation of mountaineering, swimming, and cycling. In literary matters he specialized in sociology, ethnography (the study of races and their peculiarities), and published "A Short History of Citizenship and Sociology," &c. In the course of his studies he became acquainted with the late Herbert Spencer. As a lecturer on commercial history and citizenship from 1903-10, Mr. Newland did good work.

His connection with the Tropics was kept alive by acting as London correspondent to the Bangalore *Daily Post*, and other Eastern journals, and recently by his articles on rubber and other products. He is a Fellow of several learned societies. Like the Editor of Tropical Life, "Our Friend" is a firm believer in Ceará rubber.

Regarding the British West African Association, Mr. Newland hopes to interest the Governors, as well as the Government and municipal authorities, in his scheme for a permanent exhibition and bureau to be established in London, as he feels that by doing so the interests of their various districts will greatly benefit by being unofficially represented over here, as the West Indies are through the West Indian Committee, a most useful body that no one would dream of describing as being unnecessary. From what we know of Mr. Newland and the manner in which he has overcome the rather serious opposition at first encountered in connection with his scheme, we fancy in the end "Our Friend," backed up by influential friends, will succeed; certainly the presence of such men as Sir Edward Merewether, K.C.V.O., C.M.G., the new Governor of Sierra Leone, Mr. W. H. Lever, and others at the Association's dinner, reported elsewhere, looks as though he will. Later on, when funds permit, a West African centre on the same lines as the Australian Colonies can boast, will be established in London, with samples, and literature connected with the Coast trade, and a bureau of information regarding mining, timber, planting, trade, &c. There is a good time coming for the West Coast, and "Our Friend" means that this country shall reap its full share of the benefits therefrom. Truly a most worthy object, and we wish him every success.

Business Notices.

1.—The address of Tropical Life is Messrs. Bale, Sons and Danielsson, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All **literary communications** should be addressed **to the Editor,** and accompanied by the necessary stamps for their return if not accepted.

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7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

April, 1911.

The British West African Association and the Opening Up of British West Africa.

The five colonies, S. Nigeria, the Gold Coast, Lagos, Sierra Leone, and N. Nigeria, which, united together go to make up what is generally known as British West Africa, have a great future before them if properly organized and opened up. With amended land laws and a more evenly distributed labour supply, these centres will become valuable producers of raw materials for our factories, taking in return large quantities of machinery, hardware, and other manufactures. Excepting, perhaps, tea and sugar (both of which might also be cultivated for export were it necessary), the West Coast can, and probably will, produce at no distant date nearly every important tropical product, without which countries in the temperate zone, and especially the United Kingdom, would find their revenues and the supplies of their foodstuffs, &c., reduced by fifty per cent. The man-in-the-street does not half appreciate all that he owes to the Tropics, and is almost entirely ignorant of what the West Coast does for us already and how much more it could do, were its, at present latent, potentialities properly developed. Before they can be developed, however, new channels of trade must be opened up and spread out, and the native land laws amended in such a manner that whilst the present owners, by leaving the land neglected, abuse their heritage, the mere land-grabber, or company-promoting schemer, must not be allowed to ill-use so valuable a colonial asset.

Then, again, labour questions need organizing. Possibly supplies could be brought down from the north for a time; matters of transport must be seriously considered, the loss to the purchasing capacity of the coast in cacao alone, kept back through lack of carriers to "head" it down to the coast, for shipment must be enormous, and last year was especially disappointing on this account, it is therefore high time that improved methods of rail, road, and river transport be introduced, not only down to the coast but up towards the hinterland. We must go up and meet the Sahara, must extend up there the fertility and productiveness of the coast, and not let the desert spread down into the colony, which is not impossible if care be not exercised in opening up the, at present, uncultivated lands. All this, of course, is in the future, but empire builders, whilst working for the present, must always look ahead, and think of the future.

This care for those who are to follow us is essentially the work of an association. Private individuals striving and fighting with wild nature for their own living cannot afford the time to act as philanthropists and work for others, however willing their temperaments may make them to do so. If they did, nothing would really prosper, neither their own interests to-day, nor those of the generation of to-morrow. But where single individuals would fail, they can in the aggregate succeed, not only for such matters as agriculture, labour, transport, &c., but for mining, local politics, ocean transport, &c., and this is where the newly-formed British West African Association can, and we believe will, do valuable work. What the West Indian Committee has already done for those islands, a well-organized West African Association will do for the Coast. The world has its eye on West Africa, so it is time we were up and doing. Even as far afield as Malaya they are encouraging us to go ahead. "West Africa," *Grenier's Rubber News* tells us, "is gradually getting a larger amount of interest paid it; the recent formation of the West African Association is a case in point." Such an Association is badly needed. The action of the West African section of the London Chamber of Commerce in recommending that the Association should not be allowed to rent rooms in their building, showed to what an extent the Coast was tied down "to the old regime," but it will do them no good in having thus opposed those who were only working, as all should work, for the good of the Empire. Since this little episode, we are glad to hear that a new chairman has been elected for the West African section in Sir Owen Philipps, M.P., who as Chairman both of the Elder, Dempster Line of steamers to the Coast, and of the Royal Mail Line that goes, with its subsidiary companies, to almost any part of the Tropics, we feel that the Chamber of Commerce of the most important city in the world will widen out its, at present, very narrow ideas for encouraging trade and trading. Great credit and honour is due to those old West African houses for the energy, enterprise, and personal bravery they have thrown into the task of bringing West Africa up to its present state; but the time has arrived when the pace of prosperity and improvement needs to be hastened, and the West African Committee, at its first annual dinner, with Mr. W. H. Lever in the chair, showed its determination to do their best to help in hastening its development.

Papua and its Possibilities.

"MOST of the land in Papua still belongs to the natives," the Hon. J. P. Jenkins told the audience that faced him at a meeting of the Royal Colonial Institute, "and private individuals cannot obtain it from them. The Government must first buy it and then let it to the planters. On June 30th, 1909, 56,580,000 acres were owned by the natives, 1,000,000 by the Crown, 338,000 by lessees, and 26,000 were freehold, which had been secured before the passing of the present land laws, which abolished the sales and substituted ninety-nine years' leases, subject to assessment at fixed periods. Land is naturally of much more value in some localities than in others. Blocks of rich soil, which are accessible by rivers or well-protected bays, have been eagerly sought after by the planters. No one can visit New Guinea without seeing the great possibilities which lie before the country as a producer of tropical products. In certain localities the rich soil and heavy rainfall make it specially adapted to the growth of Pará rubber, and it is stated by the owners of one or two small plantations that the trees arrive at the tapping stage fully a year earlier than in some of the other tropical islands. I measured several trees which were said to be only four and a half years old, and they were large enough to tap. Some thousands of acres of land have been, and are being planted with rubber. Thousands of acres are also being planted with coco-nuts, as the export of coprah is now, and is likely to continue, a most profitable industry. In the dryer part of the island large areas are being planted with sisal hemp, which is also a most profitable undertaking, and one from which a more speedy return is obtained than from rubber or coprah. Tobacco, cotton, bananas, maize, and other tropical products are also being extensively planted, and everything points to a marvellous increase in the products of Papua in a very short time. As a field for profitable and permanent investment it appears to have many advantages over other parts of the world where large amounts are being spent. The experimental plots of cotton which I saw growing, both Sea Island and Caravonica, were excellent. Members of the British Cotton Growers' Association might wisely direct their attention to Papua, as one of the countries which could materially assist in the growth of British cotton for British factories.

"To carry on plantation work in Papua requires capital, and to attempt it in a small way may mean waste of time and money. It takes some time to get a return, and shipping and transport as yet are expensive and somewhat uncertain. It requires both capital and good supervision to assure success; granting these, a very large return upon the investment is almost bound to result.

"Few people have any idea of the magnitude of the Island of New Guinea. It lies between the equator on the north and 12 degrees south latitude, and between 130 and 150 east longitude. Next to Australia it is the largest island in the world, containing 312,000 square miles of land, or about 200 million acres. The Dutch have 151,789 square miles, the British 90,540 square miles, and the Germans 70,000 square miles.

"It will thus be seen that the Dutch have nearly half of the whole island, and the British not quite a third, stretching along the south and south-east coast.

Pineapples as Catch crops for Hevea Rubber.

THE *Straits Bulletin*, a few issues back, pointed out that, under certain conditions, and especially if there was a favourable market for the pineapples, this fruit should make a good catch-crop between hevea trees, if widely planted. The reasons given by the writer, Dr. Boon Keng, for saying this, were as follows:—

"A plant suitable as catch-crop must have the following qualities: (1) It can grow without interfering with the rubber or retarding the growth of the latter. (2) It must mature and fruit early. (3) It must not have woody roots, which may become liable to be the sites of disease. (4) It can be easily removed without much cost and without doing harm to the roots of the rubber trees. (5) It must not harbour diseases of an infective character."

Away from a remunerative market, the fruit is, unfortunately, a dead loss. At the same time, as the fruit is said to flourish in all localities suitable for the planting of hevea, and since the plants fulfil the above requirements of a satisfactory catch-crop, it would be worth trying to develop a trade in the fruit. Failing this, possibly, if the fruit was cut out soon after forming, or even not allowed to form, the fibre contents of the leaves could be strengthened and developed sufficiently to make it pay to extract and export the fibre instead of the fruit. Then hevea would have in pineapples what Ceará enjoys with sisal (*A. sisalana*) as a subsidiary or catch-crop.

"Should a planter decide," continued our Eastern contemporary, "to raise pineapples, he must determine the system of spacing his rubber trees. On the whole one must recommend wide planting, allowing for avenues 30 ft. wide and trees 15 ft. apart to form the sides. Thus planted, 30 by 15, the hevea trees will develop to the best advantage both their root and leaf systems.

"The pineapples should be planted 3 ft. away from each rubber plant, and the lines should be so arranged on hill slopes that they serve as terraces to prevent too much wash from rain water. In this way we can get in, say, about 2,000 pineapple plants in an acre. They flower in 15 to 18 months and thus a first crop is certain in the second year. In the third year, a large and a secondary crop may be expected. After the fourth year the crop begins to deteriorate unless the plants are properly looked after. The main cause of the deterioration is that the pineapple is purely a surface feeder, and as usually the soil on which it grows has been allowed to become completely denuded, the fruit goes back if no attempt is made to restore to the ground the decayed leaves, which in the case of pineapples take a long time to become humus."

Soil-exhaustion by the plants could be greatly minimized with attention and by a judicious use of manures, but for keeping down weeds, discouraging soil erosion, helping to isolate the belts of rubber trees, and keeping the soil open and aerated, pineapple plants certainly have many points in their favour, apart from any profits to be derived from their fruit or fibre.

Cacao "to Type."

The Standardization of Cacao.

In the December (1910) number of the *Proceedings of the Agricultural Society of Trinidad*, the question of the standardization of the Island's cacao is discussed.

"We are of opinion," reports Professor Carmody, Director of Agriculture, and Mr. Carl de Verteuil, one of the leading cacao planters, "that the proposal to establish Government standards for Trinidad cacao would assist in maintaining the high reputation it has gained in the world's markets and especially in the United States, where there is an increasing tendency among purchasers to rely on Government guarantee for food products; that it would also benefit the cacao industry of the Colony in new markets where estate marks are not so well known, and that it would check any attempts by speculative shippers to sell cacao of inferior quality. As it would be an optional measure, the present method of selling according to individual types by each shipper would not be interfered with to any appreciable extent."

We are not sure what a "Government" standard signifies, unless it is to turn out the majority of the Trinidad crop of 250,000 to 300,000 bags to one or two recognized standards or types, as Bahia is doing. If this is so, then we heartily agree with Professor Carmody and Mr. de Verteuil, and would further add that until something of the sort is done the planters, as opposed to the dealers, will never derive the full profit that they could and should command, if they standardized the cacao and shipped it "to type," instead of leaving it to others to do so.

A memorandum opposing the idea was sent in by two leading shippers, Mr. John Smith and Mr. Leon Bernstein, who seemed to imagine that the interests of the shippers would suffer if the suggestion was adopted.

"The present system," these gentlemen urge, "of each shipper selling on his individual type, types well known in the different markets, has hitherto worked to the satisfaction of all concerned.* These type samples, representing the different grades, are sent away at the beginning of every crop, and the orders received are forwarded and executed on the basis of them; it is, therefore, to the interest of every individual shipper to see that the quality of the cacao he is shipping is equal to type, in order to maintain the confidence of those with whom he is dealing . . . . instead of which the system now suggested would deprive shippers of an established reputation, and of the benefit they derive at present from the well-known excellence and reliability their brands have acquired only after many years of steady and persistent work."

Further, they maintain "there will be considerable difficulty in working the scheme proposed, especially in the height of the crop season, when every shipper of any importance handles thousands of bags monthly, every bag of which under this proposal would require to be inspected and stamped with the Government stamp, thus causing serious delay and inconvenience to shippers."

"For the foregoing reasons," they conclude, "we are of opinion that no good end would be achieved by introducing Government standardization of cacao in Trinidad."

Formerly we were also in this trade; we believe our notice board still adorns one of the streets in Port of Spain, and so we are fully aware of the enterprise and push necessary to build up a successful and, above all, a remunerative connection as a cacao exporter; at the same time, so long as the present competition exists between the various firms, causing great diversity in the types shipped, Trinidad will never compete as successfully as she should and could do against other centres which can turn out much larger shipments true "to type" than Trinidad does. There is, however, nothing whatever to prevent the large buyers in Trinidad from doing between themselves what Professor Carmody and Mr. de Verteuil propose the Government shall step in and do, viz., to standardize the cacao by refusing to buy any lots sent to town that could not either pass as "good estate" (equivalent to Bahia's "superior") or ordinary (to compete against "fair" Bahia). At first, trouble may arise, but since one planter, at least, has recognized the advantage of such a move, the planters as a whole will, we believe, soon realize that by falling in with the idea, as well as with the modern requirements of the makers (it was a letter from Messrs. Walter Lowney and Co., Ltd., of America, that caused the matter to come up for discussion), they will in the end be the greatest gainers, for by some such method alone, by exporting reliable and approved produce certain to turn out in the factory correctly "to type," will they secure against other centres a certain and steady market. For these reasons we hope that we have not heard the last of the matter.

* This is a debatable point unless taken purely from the middleman's or shipper's point of view.

Indian Agricultural Notes.

Mr. James Mollison, the retiring Inspector-General of Agriculture for India, whose name appeared in the New Year's list of honours as a recipient of the Star of India (C.S.I.), has had a career of success and usefulness which deserves more than a passing notice. His training began in a thoroughly practical school. His father, the late James Mollison, for sixteen years, down to 1885, Factor and Commissioner on the Dochfour Estates, near Inverness, was a recognized expert in land valuations, an excellent judge of a good shorthorn and a good roadster, a Director of the Highland Society, and a powerful influence in the management of county affairs. James Mollison, the eldest son of the family, entered the Royal Agricultural College at Cirencester in 1877. Toward the end of his full two years' course of study, he passed the examinations of the Royal Agricultural Society of England—the only successful candidate out of thirteen—and gained the Society's diploma and free life membership, and finally he carried off the diploma and gold medal of the Royal Agricultural College. After a few years of probation as a land agent and farmer in Southern England, he spent three years in charge of one of the largest horse and cattle ranches in Western Canada and went to India in 1890.

In the Government Service of Bombay Presidency, where he laid the foundation of the first thoroughly practical Department of Agriculture in India, Mr.

James Mollison spent thirteen strenuous and fruitful years and made for himself that reputation as an agriculturist and as an organizer which induced Lord Curzon to select him as the first Inspector-General of Agriculture for all India and Burma, on the creation of the Department in 1901. The almost incredible difficulties and positive opposition which he had to overcome in Bombay during his first five years in a comparatively subordinate position, paved the way for a rapid ascent to the top of his profession, and it may be justly claimed for him that in a brief space of time he has built up a great department that will extend and endure and be an immense boon to the poorest people in the Empire. In India he began agricultural work of a genuine kind practically alone, and he left it with a department equipped with about forty highly-qualified European experts and a host of well-trained native assistants.

The Inspector-General was nobly encouraged and supported by Mrs. Mollison (Edith Mary MacRae), who, in her own quiet way, did much useful and highly-appreciated work among native ladies, and generally among the people of India with whom she and her husband came into the most intimate and friendly intercourse during their long annual sojourns on tour in the various Presidencies.

The Dutch Government Bureau for the India-rubber Trade and Industry.

By Dr. J. G. VAN ITERSON, JUNR.

As many of your readers either sell their rubber to our Dutch importers or buy it from them, I should be glad if you will allow me to draw their attention, through the columns of TROPICAL LIFE, to the following scheme, formulated by the Dutch Government for the benefit of all concerned, sellers, buyers, and consumers.

No doubt your readers are aware that, since May 15th, 1910, a Bureau for the india-rubber industry has been established at Delft (Holland) by the Dutch Government. This Bureau has been founded to decide upon methods for testing rubber in a raw, as well as in a vulcanized state, and also to supply the rubber trade and industry with all the information possible.

Without undervaluing the great practical experience that rubber importers and manufacturers have acquired in the course of the past few years, it is acknowledged by the majority of experts, and it is also the strong conviction of the Bureau, that the basis on which the trade in raw rubber is at present carried on is very imperfect as regards the valuation of the raw rubber, since the basis is decidedly not in accordance with the progress which science has made of late years.

Nowadays the valuation is made on the outward appearance only, and is therefore founded on empiricism, with all its defects. The amounts of moisture, resin, inorganic and organic impurities, cannot be satisfactorily determined in this way, and there is no denying that the knowledge of these particulars is of such importance to the rubber manufacturer that, sooner or later, he must obtain it. They can only be determined by the aid of analytical chemistry. It is true that the quality of the raw rubber is not determined by this alone, as the mechanical properties, or elasticity, &c., are of great importance when valuing. The Bureau is therefore glad to say that it will be shortly in possession of the necessary machines and apparatus to determine these physical properties; and as the methods for the determination of these are still imperfect, investigations by experts will be carried out with a view of improving them.

Although there can as yet be no question of perfectly reliable valuations in a scientific way, it would be desirable to examine whether it would be of use to all who are interested in raw rubber to have the results of an analysis of the raw rubber offered for sale. In order to obtain a clear insight into this matter, the Bureau, with the permission of the Minister of Agriculture, Industry and Trade, will analyze all samples of rubber, gutta-percha and balata during the months of February, March and April of this year free of charge and give a certificate of the results of this analysis. This chemical analysis will consist of: (1) Determination of moisture; (2) determination of resins; (3) determination of inorganic impurities; (4) determination of organic impurities. Samples weighing from ½ to 1 kilogram must be forwarded post paid to the Bureau, 81, Oude Delft, Delft, Holland.

These samples must, as much as possible, agree with the average composition of the parcel, and the senders are recommended to see that this is the case. The Bureau cannot be responsible for the choice of sample made by the sender. Part of the sample will be used for the analysis, another part will be kept by the Bureau as a control-sample, and a third portion will be returned to the sender, duly marked, with the certificate of the analysis. This last part can be shown with the certificate when the rubber is offered for sale. If the sender wishes to have more marked samples of the same parcel, the sample must be larger in proportion. The Bureau expects, together with the sample sent, a complete account of the name, origin, &c., of the rubber, and all further particulars which are thought of importance by the sender, so that the certificate can be filled in as completely as possible. As it is well known that parcels of rubber, containing great quantities of water, decrease in weight in the long run by loss of moisture, which will be especially the case with the sample, it is desirable to mention where, and since when, the parcel has been stored, how it is packed (cases, bales, &c.), and the date when the sample was taken. That will enable buyers to conclude how far the amount of moisture of the sample analyzed by the Bureau will agree with that of the parcel. In order to facilitate the senders in complying with this request, the Bureau will send, on demand, forms for filling in.

At the close of these three months it can be judged how far it is desirable to propose to the Minister of Agriculture that this experimental period be prolonged, or whether the Government can at once issue the necessary regulations authorizing the Bureau to undertake regularly, at a fixed charge, the analysis of raw rubber.

The Bureau trusts that all who are interested in the raw and manufacturing rubber trade, whether importers, brokers or manufacturers, will co-operate to make this experiment a success. This can be facilitated if those making use of its services will express

their opinion and state their experiences and wishes so as to help the authorities draw up the final regulations.

Discussing the above matter with Mr. Robert Bridge that gentleman told us that his firm, Messrs. David Bridge and Co., Ltd., are supplying the experimental machinery required, and were, at the time of speaking, expecting to deliver same very shortly.

Reviews.

The Rubber Country of the Amazon. By Henry C. Pearson, Editor of *The India Rubber World*. 228 pages, including index, appendix, &c. 175 illustrations. Price, $3 (12s. 6d.). New York, U.S.A. *The India Rubber World*.

It must be no easy matter to go up the Amazon to study rubber *chez-il*, not only in Brazil, but in Bolivia, Colombia, and Peru, to say nothing of a look in at Barbados (W.I.) "en route," but Mr. Pearson gives us the idea of having done the task he set himself and done it well. There is a good deal to be learned in this chatty volume, with facts for the serious trader, and pretty pictures for the tourist and globe-trotter, both of whom would, however, be well advised to study such a pioneer work when they want to "trot round" the Amazon. A perusal of the pages leaves all classes with a carefully drawn-up and detailed description of the great rubber industry of the Amazon valley, showing how the trees grow, and are tapped; how the rubber is prepared, and the, at present, all but insurmountable difficulties that at times are encountered, before the rubber "pelles" are safely stowed away on board the Booth or other liner, for shipment to the consuming centres, making one feel that if these centres have hitherto shipped rubber to pay in face of the cost of such transport, how much more easily will she do so when the Madeira-Mamora and other railways are completed. Not only are such particulars given of the State of Pará, the area first reached, but Mr. Pearson penetrated into and describes the rubber traffic of the States of Amazonas, and Matto Grosso, and the territory of the Acré as well, taking us down into Bolivia, and boarding Nicholas Suarez in his home, if it can be called boarding, since a clever little sketch of that firm, rather hard, face shows this rubber baron to have a clean-shaved chin. "Suarez," we are told, "has practically controlled the carrying trade up and down the Madeira, as well as the gathering and collecting of the rubber along many of the great waterways above the Falls (of the Madeira). He employs about 4,000 men, and is said to be worth from $35,000,000 to $40,000,000." Leaving Bolivia and Suarez, we are taken to the Montaña, Peru, to the Acré, and then up to the southern portions of Colombia, and Venezuela. It is a long journey, but a pleasant one, and well described. Until we can afford the time and money necessary to make such a trip ourselves we shall keep Mr. Pearson's book close by us for reference, and advise all readers to do the same. The appendices are of considerable value. Appendix B gives the exports of Brazilian rubber from 1836, of Bolivian from 1890, and from Peru since 1900, in all cases up to 1909. Appendix C goes into details of the loss in shipment through evaporation, or in manufacture through washing, &c., and gives a table of prices for each month from 1900-1910 inclusive. Appendix D gives a list of the various latex-producing trees to be found in the Amazon valley, including twenty-one Heveas, one Castilloa (*C. Ulei: Warburg*), seven Sapiums, and six Balata or Mimusops. Both for pleasure, as well as for profit, we are pleased that such a book has been published.

The Cultivation of Hevea. A Manual for the Planter. By Dr. P. J. S. Cramer, Director of Agriculture, Surinam. Translated from the Dutch by Mr. Stuart R. Cope and Miss A. Content. 132 pp. Price, 6s. post free. J. H. de Bussy, Amsterdam, or Tropical Life Publishing Department, London.

This is a carefully-thought-out work, carefully translated; we know by experience how difficult it is to translate such works into English, especially from the Dutch. Planters of *Hevea brasiliensis* cannot afford to pass the book by, it will be found on all practical planters' bookshelves, side by side with our own "Soil and Plant Sanitation," and Mr. Herbert Wright's works. In this volume Dr. Cramer discusses Pará cultivation at all the chief centres—Java, Singapore, Ceylon, the Federated Malay States—which he could do from personal knowledge, since he visited these centres in 1909 on purpose to study the methods in vogue there. On this account the author's criticisms are deserving of careful attention, since, whilst being a tropical planting expert, he is speaking of centres new to him, and therefore about which he has no prejudice for or against.

The cost of production in the Malay Peninsula he finds rather high, as one coolie per acre is certainly required. The consequences of liming in Malaya are surprising, estates almost liable to be abandoned recover by its use, and compare favourably with their neighbours. Dr. Cramer, after a few remarks on first clearing of the ground, discusses virgin and secondary jungle, lalang soil, the question of drainage as a protection against wash and soil erosion, green manures, and seeds *versus* stumps, and how to plant them. Chapter V brings us to weeding and the upkeep of the estates, clean *versus* semi-clean and "dirty" land being compared with those planted with cover-crops. Catch and inter-crops also receive attention, whilst Chapter VII is given up to the trees—tapping, pruning, and training them. Tapping, of course, is fully gone into, and many diagrams given of the various systems. The chapter on tapping tools is the weakest part of the book, none of the well-known Bowman-Northway knives, which Dr. Cramer must often have met on his journey, more often probably than any other individual knife, seem to have a place in the book at all. Respecting cups, the author seems to favour porcelain, though we should have thought them too dear. The idea that cast-glass cannot be made with the name cast on, is of course incorrect, it being quite easy to do so. The concluding pages on machinery contain much useful information. Regarding the shipment of the rubber, Dr. Cramer comments on the general use of Venesta cases in Malaya. We strongly recommend the book to all interested in rubber planting; it has been carefully compiled, and is easy to refer to, whatever section is needed.

Cotton.

The following were the prices for Cotton in London on April 7th, according to Messrs. Slann and Davies :—

	Good Fair.	Good.	Fine.	Superfine.	Compare Good 1910.	Compare Good 1909.	
	d. d.	d. d.	d. d.	d.	d. d.	d. d.	
Surat kinds* ...	$6\frac{11}{16}$ to $6\frac{13}{16}$	$6\frac{15}{16}$ to $7\frac{1}{8}$	$7\frac{3}{16}$ to $7\frac{7}{16}$	—	$6\frac{1}{4}$ to $7\frac{1}{4}$	$4\frac{9}{16}$ to $4\frac{3}{4}$	per lb.
Madras	$6\frac{15}{16}$ to $7\frac{1}{16}$	$6\frac{7}{8}$ to $7\frac{5}{16}$	—	—	$6\frac{1}{2}$ to $7\frac{1}{8}$	$4\frac{3}{8}$ to 5	—
Bengal	—	$6\frac{1}{4}$	$6\frac{1}{2}$	$6\frac{5}{8}$	$5\frac{7}{16}$	$3\frac{15}{16}$	—
Assam	—	$6\frac{1}{2}$	$7\frac{1}{4}$	$7\frac{3}{4}$	$6\frac{1}{4}$	$4\frac{3}{8}$	—
China	—	$6\frac{3}{8}$	$6\frac{3}{4}$	$7\frac{1}{8}$	$6\frac{5}{8}$	$4\frac{7}{8}$	—
West Indian ...	8	$8\frac{3}{4}$	$9\frac{1}{4}$	$9\frac{1}{2}$	$8\frac{1}{4}$	$5\frac{1}{4}$	—
Sea Island ...	$12\frac{1}{2}$	$14\frac{1}{2}$	18	21	17	$8\frac{1}{8}$	—
West African ...	$7\frac{3}{4}$	$7\frac{11}{16}$	$7\frac{15}{16}$	—	8	—	—
East ,, ...	$7\frac{1}{16}$	$8\frac{5}{8}$	$10\frac{1}{4}$	—	$8\frac{3}{4}$	—	—

* Liverpool quotations.

Trade demand continues on a fair scale, and has helped American "Futures," which have improved during the week (ending April 8th) 7 to 10 points for near positions, and about 5 for distant. Middling has been raised 13 points to 7.79d. The market has also felt the effects of reduced Port movement, and of the returns of the Spinners' International Federation, shewing stocks of American at mills to be 188,000 less than last year, and 479,000 less than in 1909. East Indian has been sharply reduced in price, but still without inducing much business.

The import into Liverpool this week amounted to 39,531 bales, since September 1st 3,734,298, same week last year 46,092, last year's total 2,362,604 bales. The estimated Sales amounted to 57,000 bales, including "called.' Middling American is quoted at 7.79d. per lb., last year 7.94d., 1909, 5.27d.

Movement of American Cotton since September 1st :—

	1910-11.	1909-10.	1908-09.
Brought into sight	10,771,000	9,141,000	11,942,000
Exports from United States since September 1st—			
To Great Britain	3,046,000	1,896,000	3,026,000
To Continent, &c.	3,435,000	2,978,000	3,838,000
Total crop	—	—	13,825,000

The latest quotations of Americans for delivery, basis middling, any port, G.O.C. :—

	April 7th.	Last Week.	Last Year.
	d.	d.	d.
April	7.54	7.43	7.72
Apl.—May	7.53	7.43	7.67
May—June	7.53	7.43	7.64

Coffee

By Messrs. C. M. and C. Woodhouse.

Good supplies of East India have been offered during the week ending April 8th, and, with a good demand prevailing, firm rates were obtained, the home trade again competing for fine descriptions. Costa Rica was also in request, and about 7,000 bags have been sold at fully steady prices. According to Messrs. Düüring and Zoon the stocks in the principal ports of Europe on April 1st show a decrease for the month of 96,000 bags against a decrease of 209,000 bags in 1910; the visible supplies show a decrease of 423,000 bags against a decrease of 287,000 bags at the same time last year. The result of the sale of 600,000 bags coffee by the Valorisation Committee was as follows—

Havre ...	112,500 bags	... ...		at $73\frac{1}{2}$ to 75 francs
Hamburg ...	105,000 ,,	...	(filieres)	,, 56 ,, $56\frac{3}{4}$ pf.
		(Imported Santos)		,, 59 ,, $60\frac{1}{4}$ pf.
	8,000 ,,	... ...	(Rio)	,, 57 ,, $58\frac{1}{4}$ pf.
Bremen ...	12,000 ,,	... ...		,, $60\frac{5}{8}$ pf.
Trieste ...	12,500 ,,	... ...		,, $69\frac{3}{4}$ to $72\frac{3}{4}$ kroner
Rotterdam ...	20,000 ,,	... ...		,, $35\frac{3}{8}$ cents
Antwerp ...	25,000 ,,	... ...		,, 72 francs
New York ...	300,000 ,,	... ...		,, $12\frac{3}{4}$ cents
Marseilles ...	5,000 ,,	... ...		,, 73·90 francs

No further sales will be made in New York and the 300,000 bags to be offered in Europe on April 22nd will complete the sales for 1911.

Futures were about steady during the week, but at the close, values declined on lower advices from the Continent and cheaper offers from Santos, and the latest price of September Santos is 1s. 9d. lower for the week. We quote :—

		To-day.	Mar. 30th, 1911.
London ..	Santos, Sept. delivery	46s. $1\frac{1}{2}$d.	47s. $10\frac{1}{2}$d.
New York ..	No. 7 Rio ,, ,,	9·86 cents	10·26 cents.
Hamburg ..	Santos ,, ,,	51 pf.	$52\frac{3}{4}$ pf.
Havre ..	Santos ,, ,,	$63\frac{1}{4}$ francs	$65\frac{3}{4}$ francs.

The receipts at Rio and Santos from July 1st, 1910, to April 5th, 1911, were 9,877,000 bags, against 14,022,000 bags and 11,521,000 bags in the two previous seasons respectively.

Sales include the following, viz. :—

East India.—Mysore, 63s. 6d. to 66s. for smalls, 64s. 6d. to 70s. for low middling to good middling, 80s. for fine middling, 67s. to 73s. for middling to good bold, 77s. 6d. to 99s. for fine to superior bold; Coorg, 62s. to 64s. 6d. for smalls, 63s. 6d. to 69s. 6d. for low middling to good middling, 66s. to 71s. 6d. for middling to good bold, 75s. to 77s. 6d. for fine bold; Neilgherry, &c., 63s. 6d. to 70s. 6d. for smalls, 66s. to 77s. for middling to fine middling, 72s. to 84s. 6d. for good middling to fine bold; Naidoobatum, 66s. to 68s. for smalls, 67s. to 78s. 6d. for middling to fine middling, 72s. 6d. to 88s. for good middling to fine bold, 88s. to 95s. 6d. for extra bold.

Jamaica at 64s. for fine fine ordinary, 65s. 6d. for ordinary bold.

Costa Rica at 63s. 6d. to 66s. 6d. for smalls, 65s. to 71s. for fine ordinary to good middling, 68s. to 75s. 6d. for middling to good bold.

Guatemala at 63s. to 63s. 6d. for smalls, 63s. 6d. to 65s. 6d. for fine ordinary to low middling, 64s. 6d. to 68s. for bold.

Mexican at 63s. for smalls, 64s. 6d. to 66s. for low middling.

Ecuador at 58s. for damaged palish bold.

Colombian, &c., at 64s. 6d. for fine ordinary, 68s. for bold.

The India-rubber Market.

By Messrs. S. Figgis and Co.

On March 30th the market had a sudden reaction after the serious decline previous to March 28th, and closed very firm with few sellers. Sales of hard cure fine Pará distant delivery were made up to 6s. 4d., and value of near about 6s. 3d.; soft fine value about 5s. 7d. to 5s. 8d. Negroheads, scrappy Manaos, about 4s. 5d.; Cametas nominally 3s. 8d.; and Island nominally 3s. 3d. Caucho ball, value of up-river f.a.q., 4s. 6d., with buyers rather than sellers.

At the auctions, which comprised 345 tons of Eastern Plantation, the demand was slow and prices were at first on the average 4d. to 6d. lower, then prices went 4d. dearer on the average.

Plantation Malay.—Sheets, fair to fine smoked, 6s. 4¼d. to 6s. 8¾d.; partly smoked, 5s. 8¾d. to 6s. 4d.; fair to fine unsmoked, 5s. 10d. to 6s. 3d.; damp, pressed, and immature, 5s. 0¾d. to 5s. 10d. Crêpe, fair to fine, pale and palish, 5s. 11½d. to 6s. 5d.; light brown and grey, part streaky, 5s. 7d. to 6s. 0½d.; clean brown, 5s. 3d. to 5s. 9½d.; dark brown, part specky, 4s. 8d. to 5s. 6¼d.; black and soft, 4s. to 5s. 4d.; smoked, 5s. 7½d. to 6s. 3½d. Scrap and virgin, fair to good, 4s. 4¼d. to 4s. 11½d.; mixed and inferior, 3s. to 3s. 11d. Rambong, scrap, 4s. to 4s. 7d. Castilloa, thin sheet, 5s. 1½d.

Ceylon.—Sheets, fair smoked, 6s. 5d. to 6s. 5¼d.; biscuits, fair to fine, unsmoked, 5s. 7d. to 6s. 4½d.; biscuits, damp and pressed, 5s. 4d. to 5s. 9¾d.; Ceará, 5s. 6d. to 5s. 7½d. Crêpe, thick, fair to fine, 6s. 1¼d. to 6s. 3¾d.; fair to fine, pale and palish, 5s. 11¾d. to 6s. 5d.; light brown, 5s. 7¼d. to 6s.; black and soft, 4s. 3½d. to 5s. 4d.; smoked, 6s. 3¼d. Scrap, cuttings, &c., fair to fine, 4s. 5½d. to 5s. 2¾d.; mixed and inferior, 3s. 2½d. to 4s.

Mattogrosso and Mangabeira.—Santos sheets, fair, 3s. 2¼d.; part sandy, 3s.

Mozambique and Zanzibar.—Manihot brown crêpe, 4s. 8d. to 4s. 11¼d.; Manihot soft block, 3s. 8d. to 3s. 9¾d.; Lamu ball, part sandy, 4s. 0¾d. to 4s. 2¾d.; Lewa ball, fair, 4s. to 4s. 5d.

Java, Sumatra, and Rangoon.—Soft sheet, 3s. 6½d.; soft whitish block, 2s. 4½d.; soft white heated scrap, 2s. 9d.

Jequie.—Thick sheets rather wet, 4s. 2¾d.

Malaysian.—Dark brown, smoked crêpe, 4s. 8d. to 5s. 0¼d.

By April 13th the Pará market, after being very unsettled and constantly fluctuating, settled down to 5s. 7d. for spot, with Caucho ball at 4s. to 4s. 2d. The auctions lasted from April 10th to 12th, and at the opening there was a good demand for the better qualities, and prices were steady, but as the sales progressed the demand became dragging and prices, in sympathy with Pará, fell away, the brown and darks showing the greater decline, being 4d. to 10d. lower than a fortnight ago, while the better grades finished 3d. to 5d. easier. Scrap was very moderately offered, but there was little demand for it.

Prices for plantation included: Smoked Malay sheet, fair to fine, sold at 6s. to 6s. 6¼d., and partly smoked at 5s. 6d. to 5s. 10d.; unsmoked sheet, fair to fine, at 5s. 8d. to 6s. 3¼d. Crepe, fair to fine pale and palish part thick gristly, at 5s. 5½d. to 6s. 4d.

Ceylon: Sheet, fair smoked, 6s. 1d. to 6s. 4¼d. Unsmoked sheet and biscuits, fair to fine, at 5s. 10d. to 6s. 3d. Ceará, at 4s. 11d. Crepe, thick gristly palish to pale, at 5s. 10½d. to 6s. 3½d.

Pará rubber statistics for the month of March (tons):—

	Pará.	Caucho.	1911.		1910.	1909.	1908.
Receipts at Pará ..	2,880	650 =	3,530	agst	5,210	4,140	4,240
Shipments to Europe	1,910	560 =	2,470	,,	3,400	2,480	2,720
,, America	620	70 =	690	,,	1,280	1,970	1,420

Crop statistics, June 30th, 1910, to March 31st, 1911 (nine months):—

		Pará.	Caucho.	1910-11.	1909-10.	1908-09.	1907-08
Pará Receipts	1910-11	24,650	4,580	29,230	32,180	30,420	28,680
	1909-10	26,930	5,250				
,, Shipts., Europe		11,860	3,290	15,150	15,590	14,360	17,110
,, ,, America		9,530	1,000	10,530	15,300	15,060	10,560

Rubber Share Market.

We see by Messrs. Zorn and Leigh-Hunt's mid-weekly report on the rubber share market, dated April 6th, that most of the active share-prices appreciated in value during that week. Rubber itself shows no inclination whatever at present to dip below the 6s. per lb. mark, but the penny ups and downs keep shares constantly on the dance, and the *average* price being obtained is comparatively ignored. Amongst the most promising issues, we find the Seletar Company's shares very attractive, although it is known, however, that the actual crop will be very much less than the estimate (25,000 lb.), but few are aware of the reason, which is due to the growth of the rubber having been somewhat hindered by pineapples,* and only light tapping has been possible so far, but the pineapples are now being removed and the rubber (which has suffered no permanent injury) already shows benefit.

Alor Pongsus are unchanged at 1 premium, though shares have been better at 1⅛ premium. Anglo-Dutch shares are dull at 17s. Anglo-Malays are unchanged at 23s. 6d. Bandjarsaries can be obtained at under 2, and at this price look decidedly attractive; we hear that the company's progress is now quite satisfactory. Bantengs are better at 2⅝, and Batu Tigas have improved to 4¾. Briehs have been in demand, and have hardened to 1¼ buyers, and Borneo Trusts have a distinctly better appearance at 3s. 6d. discount bid. Bukit Sembawangs are a good market at 4½d. premium bid, and Ceylon Parás have attracted attention at 11s. Chersonese are at 4s. 1½d. Cicelys are steady at 2¼,

* *See* p. 72 *re* "Pineapples as Catch Crops for Hevea Rubber."

but Consolidated Malays are rather weaker at 23s. 6d. Damansaras are 7⅜, and Dennistowns have found buyers at 1½. Duckwaris are quiet but firm at 3s. 1½d. Golden Hopes are unchanged at 4⅜, but Highlands and Lowlands have strengthened to 5⅜. Kamunings are up a trifle to 5s. 3d. premium, and Kapar Parás have reached 9¼, on the satisfactory dividend-paid report. Kepitigallas are immovable at 18s., but Kuala Lumpurs have improved to 8. Lanadrons keep around 5. Langkat Sumatras, in spite of the company's excellent report showing a 15 per cent. distribution, are on the easier side at 3⅜. Ledburys look weakish at 1¾ premium. Linggis were at one time 51s. 6d. buyers, but have reacted to 50s. 9d.; they are even now 1s. 3d. up on balance. The company's new subsidiary is expected to appear just after Easter. Malaccas are exceptionally strong at 10, and Merlimaus have picked up to 5s. 10½d. Patalings are unchanged at 2 15-16, but Peraks are the turn higher at 9s. Rubber Trust shares keep firm at 1 premium, and Sapongs have been taken at 1⅜. Selangors look a good market at 3 1-32 cum div., and Sempahs have been buyers at 21s. 6d. Sengats are just 5s., and Shelfords have not budged from 3⅝. Straits Bertams are slightly better at 7s. 4½d. Strathmores are wanted at 1⅝, but Sumatra Parás are rather sellers at 11s. 4½d. Taipings have changed hands at 2s. 10½d., and Tebraus were placed up to 3¾; they are now 3 11-16—perhaps sellers. Tempehs keep firm at 1s. 6d. United Serdangs have not moved, being 5½, but United Sumatras have improved to 9s. 3d. Vallambrosas are considerably better at 36s. 3d.

So far as we can see it is the young producers' shares which will come into special prominence during this year's coming activity.

Tea.

By Messrs. Wm. Jas. and Hy. Thompson.

At the auctions the week ending April 8th, a certain easing in values has taken place. Among Indians all descriptions except good liquoring and fine kinds were affected, and quotations for common grades now show nearly ¼d. per lb. decline from those ruling a fortnight ago. Ceylons of the same grade are also hardly as firm, although for the small quantity of good quality tea included in the offerings high prices were in nearly every case forthcoming.

A somewhat quieter tone was noticeable with Indian for common and the plainer kinds of low medium tea, and many red stalky parcels offered failed to reach last prices and were, as a rule, withdrawn. Common grades were perhaps a shade easier to buy, but on the whole show little change from prices ruling at last Wednesday's sale. Fair black leaf sold in some quantity at 7¾d.—8d. per lb. Good liquoring medium grades were competed for, especially thick coloury autumnal flavoured parcels from the Dooars and Assam, while the few tippy teas on offer from the latter district sold well. A few Southern Indian and Travancore invoices passed with a steady tone at about late quotations. To date 129 final invoices have been sold, compared with 109 at the same date last year. The highest averages were:—Assam—Beheating, 1s. 1½d.; Thanai, 11¾d.; Jaipur, 11½d.; Kharjan, 11¼d.; Hansura, 10½d.; Lattakoojan and Deohall, 10¼d. Dooars—Sankos, 10¼d.; Kurti, 9½d.; Newlands, Ghatia and Lankapara Co., 9d. Darjeeling—Tukvar Co., 1s. The average of the whole sale was 9d. per lb., compared with 7⅞d. at the same sale 1910.

Apart from a very strong demand for good to fine teas due to the anxiety of buyers generally to secure good quality while still available, the market for Ceylons must be quoted as being barely steady, though little actual change in prices can be recorded. Tea for price here and there gave way to the extent of a farthing, rather more being obtainable at 7¾d. than of late, with an occasional lot at 7½d.; but at this figure only poor quality could be bought. Medium teas, both leaf and broken, showed little or no change. Good to fine Pekoes and Orange Pekoes came in for strong competition from both home and shipping trade, and frequently made distinct advance on last week's rates. Dusts and fannings are firm. The highest averages obtained were:—Cranley, 11¾d.; Goatfell, 11d.; Talawakelle and Radella, 10¾d.; Wootton, St. Leonards and Portmore, 10½d.; Wangie Oya, Agrakande, Tillicoultry, Clydesdale, Nutbourne, Labukelle, and Pita Ratmalie, 10¼d. For the whole sale on estate account the result was 9d. per lb.; last year 8d. per lb.

Privately.—Since our last, the China market has been fairly active, principally among low black leaf teas. A few Continental inquiries have been received for better class Monings from 1s. to 1s. 6d. per lb.

The smaller quantity of Java on offer received scarcely the same attention as last week's sale, and while the majority of teas maintained their values, a few Broken Pekoes sold in favour of buyers. The highest averages obtained were:—Goalpara, 9½d.; Tanawattee and Djati Nangor, 9d. For the whole sale on garden account the average was 8½d. per lb., against 7½d. per lb. a year ago.

Sugar.

On April 6th we learnt from Mr. C. Czarnikow that in Cuba not only 20 factories have finished grinding, but many of the other 151 have temporarily stopped work on account of heavy rains, which promises moderate receipts for next week, and if the rain does not promptly stop, it may seriously impede harvesting. As yet, planters seem to consider the showers beneficial, not only for the future crop, but also for the fields now being cut—only the rain must not last. The weather to-day is called unsettled, therefore there seems to be a chance of the sky clearing up. The market took a firmer view of the situation, especially as plague is reported from some Eastern districts in Java, and though shippers cable that the outbreak is not alarming, nor even serious as yet for the crop, further news will be watched with great interest, as Java Sugars are wanted. The American meltings are likewise considered stimulating; the weekly figures have led us to believe only in slight excess meltings during March, but now Willett estimates them at 216,000 against 194,000 tons, which mostly offsets the January-February shortage, and this week's meltings are again estimated at 50,000 against 42,000 tons, though there are no exports this year.

For these various reasons the market was strong,

and August moved from 10s. 6½d. to 10s. 5¼d. to 10s. 10¾d. to 10s. 9½d. to 10s. 10½d., equal to 4.27½ cents New York, whilst next crop moved from 9s. 9¼d. to 9s. 8¾d. to 9s. 11d. The weather is not favourable for sowings just now, 6 centigrades frost being reported from Germany yesterday, but it seems that 5 to 7 per cent. excess area is expected there, whilst the other countries report nothing new, the increase in Hungary more than counterbalancing any small decrease in Bohemia, whilst Belgium will be less, and France, as well as Holland, may not quite come up to last year.

The American market has remained very steady throughout the week, but business has been less active. Holders were more reserved, and the last transactions that have taken place in Cuban Sugars were at 2½ cents c. and f. for second half April shipment. The spot quotation is still 3.86 cents=11s. 6¾d. c.i.f. for Cubas=10s. 0¾d. c.i.f. for 96 per cent. Javas=9s. f.o.b. Hamburg for 88 per cent. net beet.

Cane sugar in United Kingdom has been firm in tone, but only small transactions have taken place, owing to lack of supplies. Only about 1,100 bags grocery crystallised West India have been offered in auction, realizing fully steady prices. Low sugars are in good demand, but very little is offered. From cane-producing countries the chief news is from Cuba and Java, to which we refer above. The plague in Java is said to be localized in the hilly Malang district, and some authorities believe that the plains are too hot for the rapid spread of the infection. That, of course, remains to be seen. The West Indian mail reports that the weather in Barbados has been very favourable for the growing crops, and that the cane juice this year is of excellent quality. The total transactions of British West India for the week amounted to only about 1,500 bags. Crystallised Demerara, good middling yellow, 15s. 9d.; Syrups, middling yellow, 13s. 9d.

In Liverpool about 150 bags Peruvian Syrups, due, sold at 9s. quay, basis 89 per cent.; about 100 bags Brazil at 9s. 3d. quay.

The London Cocoa Market.

By The Editor.

The landings of cocoa in London since our last have been very heavy, so much so, that in spite of substantial deliveries our stock increased 5,000 bags in a fortnight (to 118,000 bags on April 1st), finally closing at 119,500 bags on April 8th. The market meanwhile has been a quiet one, buyers perhaps having the advantage in the game of higher or lower values. Trinidads are receiving less attention, in spite of the small stock we hold and the very restricted shipments that have found their way to the United Kingdom since October 1st (under 8,000 bags). The last transactions in this growth show a drop of 1s., and include good middling red, on April 4th, at 58s. Grenadas, up to the sale of April 11th, can hardly be said to have held their own, and sellers' ideas of 56s. for the best were not supported, buyers preferring to talk of 54s., or at the most 55s. This growth, according to the last returns (to March 20th) had shipped 43,000 bags since October 1st, against 48,000 last crop (1909-1910), so is 5,000 bags behind. The "Sargasso" has arrived with 7,000 bags on board (included in the above), about 4,000 of which were offered in London on April 11th. The home trade has been supporting the Grenada and West Indian markets generally, and buying recent arrivals freely, so that nothing remains unsold. The Gold Coast, judging by the landings and sales, must have done well in January and February, as she did in December, when she closed the year with a 14,000,000 lb. shipment for the month (13,918,709 lb. to be exact), bringing her total up to 51,692,000 lb., against 45,000,000 the year before, 28,500,000 in 1908, and 21,000,000 in 1907. Given the transport facilities, this centre could have, I feel sure, turned out over 60,000,000 lb., the cocoa being on the trees had there been carriers to take it down to the coast. For the three months January-March, San Thomé exported 182,358 bags to Lisbon, against 194,000 last year and 133,000 bags in 1909. Bahia planters still complain both of the quality and quantity of their exports, but more of the weather and its effect on the quality. The stock in London has come down very low, and holders of "superior" are asking 58s. still, although buyers talk of only 56s. Shipments for April-February (inclusive) amounted to 403,757.

The Guayaquil receipts run large and show signs of continuing to be so; the January-March receipts were 140,800 qtls., against 58,400 last year and 120,800 qtls. in 1909. Trinidad, on the other hand, is behind, and seems unlikely to pull up this crop. From October 1st to March 20th she shipped 121,000 bags, against 151,000 last year and 158,000 in the 1908-9 crop.

The latest business done, including the sales on April 11th, leave prices as follows:—

Trinidad.—Good middling red, 58s.; good to fine marks, 60s. to 62s.

Grenadas.—A few lots of fine sold at 55s. 6d., others at 54s. to 55s.; while common unfermented is worth 50s.; fair to good fermented, 52s. to 53s.

Dominica.—Good red sold at 54s.; common unfermented to fair fermented at 48s. to 51s.

Jamaica.—Good red sold at 54s.; others, 52s. to 53s.; fair at 50s.

West Coast Africa.—Good reddish sold at 50s. to 50s. 6d. in London, whilst up at Liverpool about 3,000 bags have lately been sold from 40s. to 49s.

Cameroons (*German West Africa*).—Some large piles of good red fermented were offered, apparently free from hamminess. About 1,300 bags sold at 53s., one lot realizing 54s.

San Thomé we hear very little of, although supplies continued to go into home consumption. Nominally they are valued at 51s. to 53s.

Costa Rica.—Good dullish red last realized 53s. 6d., but are now offered only at 53s.

Tanga (or *German East Africa*).—About 80 bags were offered and sold; fine boldish, 70s. 6d.; smaller and rather shrivelled (60 bags), 61s. 6d. This is nice cocoa of a Ceylon character and cure.

Guayaquil move off slowly and seem difficult of sale. Stocks meanwhile have, it will be seen, mounted up. Small sales are reported of Arriba at 60s. to 63s.; Caraquez at 55s., or 2s. lower.

Ceylons continue to sell well for the better kinds, say at 68s. to 72s. for good to fine bold; one lot of

69 bags "Palli" at 84s. 6d.; duller at 66s. 6d. to 67s.; good bold "Native" realized 57s. 6d. to 61s.; brownish, 53s.

It will be noticed by the following figures (from Mons. Alleaume's circular) that the Havre stock jumped up 26,000 bags in the month, against an increase of some 9,000 bags in London, the comparative totals working out as follows:—

	End March		End February
Havre, 1911 ...	273,277	...	247,463 bags
	April 8th		March 11th
London, 1911 ...	119,534	...	110,647 ,,
	392,811		358,110 ,,

Under the circumstances it is interesting to note the chief causes of this sudden increase, which, by the way, does not augur well for a rise in price:—

Havre Stock, March 31st.—	Landed. Bags.	Del'd. Bags.	1911. Bags.	Stock. Value Fcs.	1910. Bags.
Pará	448	2,153	18,226	70 to 74	15,866
Bahia	6,655	3,347	35,540	63 ,, 70	24,587
Venezuela ...	5,681	7,040	40,151	69 ,, 175	41,027
Trinidad	2,174	3,538	47,472	68 ,, 72	36,873
Grenada and other W.I. ...	560	415	6,849	64 ,, 70	7,261
San Thomé ...	12,104	2,325	26,585	65 ,, 66	15,913
San Domingo ...	2,192	1,725	4,202	62 ,, 65	14,128
Haiti	2,691	3,027	15,178	53 ,, 66	18,407
Accra	18,838	4,560	39,112	61 ,, 64	21,096
Guayaquil ...	2,248	1,204	15,023	70 ,, 82	7,120
Others	2,622	1,065	24,939		25,176
Total ...	56,213	30,399	273,277		227,454

London Stock, April 8th.—	1911. Bags.	1910. Bags.
Trinidads	4,659 ..	8,132
Grenadas	17,583 ..	19,942
Other W.I.	5,525 ..	5,470
British West Africa ..	7,872 ..	5,559
Portuguese W. Africa ..	6,960 ..	1,079
German West Africa ..	6,581 ..	1,916
Ceylon and Java	17,339 ..	25,848
Guayaquil	40,561 ..	17,397
Brazil and Bahia	1,560 ..	1,539
Other Foreign	10,894 ..	10,849
Totals ..	119,534 bags.	97,731 bags.

The Board of Trade figures for the United Kingdom to the end of March again show a set-back. This time it is 580 tons, making a total decrease of 684 tons for the three months, say:—

Raw cocoa only—	Landed.	Del'd. H.C.	Export.	Stock (Mar. 31st).
Jan. Mar. 1909—	14,677	7,908	1,597	10,294 tons
,, ,, 1910—	10,337	6,051	2,030	11,116 ,,
,, ,, 1911—	12,197	5,367	1,537	15,060 ,,
	Incr. 1,860	Decr. 684	Decr. 493	Incr. 3,944 ,,

In March only 1,410 tons were delivered for home consumption, against 1,988 tons last year and 3,386 tons in 1909.

We are pleased to hear that our friends, the Croydon High School for Boys, have done well with their students of late at the public examinations. Among their successes have been: two first prizes for general proficiency, one first in classics, two firsts in mathematics, four firsts in modern languages, and a silver and bronze medal for shorthand, besides several less important successes.

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Manufacturing Engineer.

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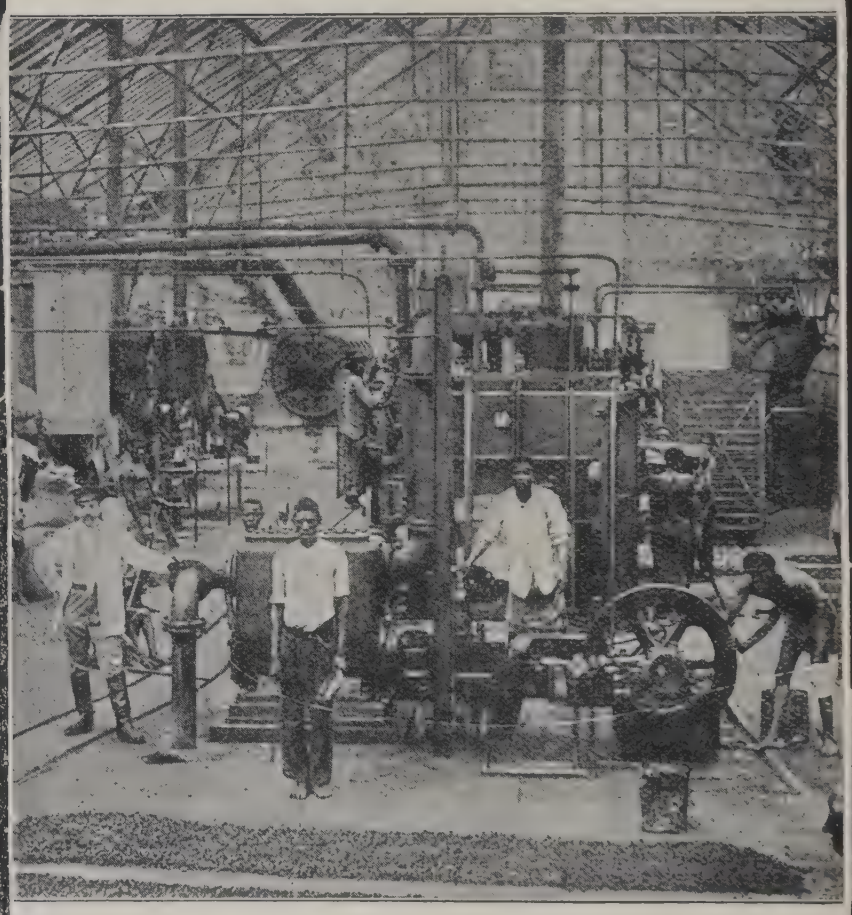

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Tropical Life:

A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

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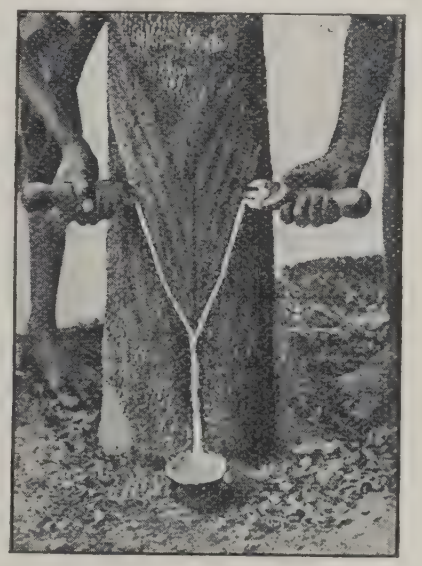

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The "Financier" on Our New Book.

THE *Financier* last month in a long article on Ceará rubber made the following remarks about our book on the management of cacao and rubber estates: "Whatever unfavourable climatic conditions Ceará (*Manihot Glaziovii*) can withstand in Brazil, recent experiences on the part of British investors whose money has been embarked in the furthering of this cultivation in British East Africa afford something stronger than a hint that it is advisable to accept even experts' statements in this connection with caution. That the tree does flourish and does give, for its size, astonishingly large yields of latex no one can gainsay, and, what is more, it both lives and is a valuable commercial asset when grown under alien conditions. But, so far as we have been able to discover, the conditions are infinitely preferable to those which obtain for the most part in the region of Brazil to which Ceará is indigenous. On the other hand, in the case of at least one failure the conditions were certainly no worse than those in Brazil, while in the matter of soil alone, we believe, they were better. It would be improper, too, to argue on the basis of this particular failure, which has been attributed by independent experts to a severe drought catching the trees at an unfortunate age, that, given soil of equal richness, a similar elevation from the sea-level and careful planting out of the seedlings, the chances of success would be reduced to a minimum, provided that the average rainfall in some other selected part of the world's rubber zone was experienced.

"So far as we can gather, the trouble in Ceylon, for example, has not been the actual cultivation of Ceará but the abstraction of latex when the trees had reached the tapping age. Towards Trincomalee there is a very considerable acreage under Ceará, and the cultivation has been tried, with varying success, in other parts of the island. It is more than probable that by now we should have heard a great deal more of this variety but for the overwhelming success which has attended the cultivation of *Hevea brasiliensis*. Had the same amount of energy been put into experiments as to the best way to tap Ceará that has been devoted to the exploitation of this part of Hevea cultivation, the chances are that we should not be still face to face with what is more or less of a problem in connection with *Manihot Glaziovii*. Mr. Hamel Smith, whose interest in all tropical cultivations is well known, has devoted a considerable amount of time and not a little ingenuity to evolving a method of tapping Ceará which will at once admit of the maximum yield of latex being obtained with the minimum of risk of damage to the tree. He approves of a pricking system

for latex extraction, and, basing his inquiries upon a knowledge of the tree's cell structures, he has invented what he has christened a multiple pricker. It is not easy to describe this instrument without the help of illustration, but a sketch of it will be found in Mr. Hamel Smith's "Soil and Plant Sanitation on Cacao and Rubber Estates," and we are probably not incorrect in assuming that planters interested in Ceará cultivation will have the opportunity of inspecting what at any rate appears to be a very ingenious, though simple, solution of this difficulty at the forthcoming Rubber Exhibition. At the moment Mr. Hamel Smith is anxious to have opinions both on his invention and the idea of pricking *versus* cutting for latex from Ceará from practical men, and we are confident that in a matter of this kind they will not be backward in coming forward.

"It is, of course, an open question whether a goodly percentage of the Ceylon Ceará trees is worth much, or, indeed, anything at all, as a rubber producer. Some years ago we heard of Ceará in the island being tapped all ways without any response in the form of latex worth speaking about, but what exactly was meant by this term "all ways tapping" we do not pretend to know. On the other hand, we have Mr. Kelway Bamber stating that in North-West Ceylon, where the land is sheltered from the south-west monsoon by mountains, a yield of over 1 lb. of dry rubber has been obtained from two Ceará trees which were not quite 2½ years old. Mr. Hamel Smith, too, states that in the same part of the island "old" Ceará trees have yielded from 2 to 8 lb. of rubber per tree, and a planter, writing to our contemporary the *Times of Ceylon* in August, 1909, expressed his opinion that in "the hitherto despised Ceará" Ceylon has "a tree better than Hevea (Pará), and with, moreover, a far freer flow of latex in quality and quantity." Mr. Hamel Smith further quotes in his "Soil and Plant Sanitation" successful tapping operations of Ceará in Hawaii, in Mysore, in German and British East Africa, in Java and elsewhere. The bulk of this tapping appears to have been carried out by excision, and not by pricking, but whether by adopting the latter method and giving it a fair and extended trial, better results than some of the extraordinarily large ones recorded in the volume just referred to would be achieved is a very open question.

"There is a consensus of opinion that Ceará, under the best conditions, is an uncertain yielder of latex. Mr. Jared Smith (Hawaii Experimental Station) says that no two trees are alike, and advocates the testing of all plantation trees when they are about 2 years old. If they are unproductive he thinks they ought to be cut out and replaced by cuttings from those which are known to be good. Commenting on this proposal, Mr. Hamel Smith remarks that "it would be interesting to examine the trees removed on account of being poor tappers, in order to see if their roots, or tubers, or any portions of them are poorly developed or overabundant, so as to account for the poor latex yield of the tree." It might be still better if, before these non-yielders were rooted up, experiments with manures were carried out. In common with Hevea and Castilloa, and indeed practically every tropical cultivation, Ceará responds to such treatment in the matter of tree growth, at any rate, and there is no reason to suppose that a poor-yielding tree might not be thus converted into a good-yielding one, the loss of the time spent in bringing it to maturity thus being saved, to say nothing of the further loss while the substituted cutting was developing. The part played by the Ceará tuber root, both in the early development of the tree and later when it has reached the tapping stage, has yet to be fully explained. Mr. Hamel Smith advances some interesting theories on this point which will, or ought to, have the attention of those engaged in the scientific cultivation of Ceará, and, if properly followed up, this writer's hints may help materially to the bringing about of a satisfactory solution. A distinction which Ceará possesses over Hevea (at least, so far as we know) is that latex is found all over the tree, even in the leaves. It has been found in abundance in both branches and roots, the existence of the latex in the latter, indeed, being responsible for the dirty rubber collected from some of the Manihot varieties in Bahia by the natives. This wide permeation of latex doubtless accounts for the fact that the best Ceará yields are obtained at night, when the dews are on the leaves, or, at any rate, when leaf evaporation is at its lowest. It is clear, however, that, despite what has already been done in collecting and collating authentic information as to cultivated Ceará, a great many points still clamour for elucidation, and as Mr. Hamel Smith has started on the task so ably and so well, we cannot do better than leave him to complete the job in his own way and at his own time."

The Prize Trophies for the Rubber Exhibition.

Among the trophies to be offered at the coming rubber exhibition, all of which were "at home" to the Press and those interested in the show, it was unanimously agreed that the $1,000 trophy of the *India-rubber World* of New York deserved the praise and admiration that it received. Already of commanding proportions, and most elegantly and suitably designed, it was placed on a double plinth in the centre of the other cups, above which it towered, a real work of art in bright and oxydized silver. On the extreme of either wing were the two artistic cups in polished silver presented by the West India Committee, whilst the large gilt Fcs. 1,000 pedestal bowl in silver-gilt, presented by the Association des Planteurs de Caoutchouc stood one side of the Castilloa cup, and the President's (Sir Henry Blake's) trophy the other. The latter is much larger than any of the photographs, including the one we published last month, led us to expect, and everyone present, whilst admiring the beauty of its outline, make, and design, also noticed its large size. Of the other prizes the Grenier's trophy, as an artistic effort, received well-deserved approval; the delicacy of the idea and execution of the design pleased everyone. Last, but not least, certainly so far as size is concerned, was the shield offered by our London contemporary, the *India-rubber Journal*. The silver shield is in its turn mounted on one made of oak so large that a separate table was needed to show it off. Meanwhile, arranged on the table between the trophies were numerous medals, offered by the Rubber Planters' Association of London, the

Kolonial Wirtschaftliches Kommittee of Berlin, and others, the whole forming a very valuable collection of prizes, on which Mr. Manders was warmly congratulated, as he deserved to be. All that now remains is for intending competitors to flock to the Agricultural Hall next month, and strive to be one of the fortunate individuals to win such valuable trophies. As already stated, these will be handed to the winners at the banquet to be held towards the end of the exhibition. We are anxious to see who will carry off the *India-rubber World's* Castilloa trophy.

Some of the Newer Insecticides and Fungicides.

By B. G. Pratt, of New York.

Since looking over the proof-sheets of your book on "Soil and Plant Sanitation on Rubber and Cacao Estates," I have received some information which may be exceedingly valuable to your patrons and readers, in fact to anyone troubled with fungous diseases on fruits, vegetables, or flowers.

It seems that the scientific production of cacao and rubber—the former more especially—is meeting with the same hardships that confront the commercial fruit-grower everywhere. The higher the state of cultivation, and the more perfect the results striven for, the more pronounced and exasperating seem the insect and fungous diseases, which almost appear to be a product of scientific cultivation. Without going into the causes which produce these conditions, it is nevertheless a fact that the highest results in horticulture of every kind cannot be attained without the use of the spray-pump and material.

Among the most notably new preparations for scale and soft-bodied insects is Pratt's "Scalecide," which has received official endorsement by the English Experiment Station at Cape Town, S.A., and also in Australia. It is one of the soluble or miscible oils, but radically different from any other commercial or home-made preparation. It contains a distinct fungicide, and is much more effective on both deciduous and citrus fruit trees than the so-highly-lauded lime-sulphur washes, and is, at the same time very moderate in price—one of the largest fruit-growers in South Africa stating that he would use it in preference to anything else even at three times the cost, because of its effectiveness and ease of application. No grower of citrus fruits should fail to look into this.

Among the many new fungicides that have been introduced in the past few years none has had such a signal success as Pratt's "Sulfocide," or soluble sulphur. It is not a lime-sulphur, neither does it contain any oil, but it is in a new form never before put on the market. There is not on record an instance where it has failed to control a fungous trouble that is reached by any other fungicide, and always with less danger to fruit and foliage at effective strengths; and most remarkable is the fact that in many instances it is thoroughly effective at a dilution of 1 part to 500 parts of water, which makes it cheap to transport long distances, and very economical to use.

The Hon. George T. Powell, President of the Agricultural Experts Association of New York, who used it exclusively as a fungicide on his large estates this past year, stated that he believed it to be the most powerful and cheapest fungicide on the market to-day, only needing time and further experiment to ascertain the proper strengths at which to use it on different forms of vegetation. You know that although Bordeaux mixture has been used and studied for the past twenty-five years, no one to-day can account for the variable and sometimes disastrous results attending its use.

I am pleased to state that the Government Experiment Station on the Island of Trinidad reports most satisfactory results from experiments with this material last year. We believe it will surely prove a boon to the cacao planter who wants to get away from the disagreeable features of the making and applying of Bordeaux mixture.

The manufacturers offer a liberal quantity of either or both of the above materials, f.o.b. steamers in New York, to any Government Experiment Station to test them on a commercial scale.

Ceylon Rubber and Cacao News.

From the Ceylon Planters' Association's Report.

The earlier portion of the rubber season was phenomenally dry, but the late advent of the S.W. monsoon was followed by excessive wet weather in the closing months of the year. The estimated crops, however, have generally been realized.

Fungoid diseases have been much less noticeable during the past season, and *cultivation by manuring has been more generally adopted with excellent results*, both as regards bark renewal and improved vigour in the appearance of the trees.

With rapidly-increasing crops to be harvested, the complaint from manufacturers of the want of uniformity in plantation rubber, originating in the difficulty of satisfying buyers' requirements from any one estate in quantity, will, it is anticipated, very shortly disappear. It is satisfactory to note that manufacturers have expressed themselves as satisfied with plantation marks they have become accustomed to, and can buy in quantity.

The highest price realized during the year at the London auctions was 12s. 8½d. in April—hard Pará realizing 12s. 6d. on the same day.

The shipments for the year were 3,586,854 lb., as against 1,492,580 lb. for 1909.

Compared with 1909 the Ceylon cacao crop for 1910 was a disappointing one, the crops being short; especially the autumn crop, which was very poor.

Owing to the unusually wet weather, during the closing months of the year pod disease was more in evidence, but with the information which planters have at their disposal there is no apparent cause for anxiety.

At the commencement of the year the market was in a depressed condition, and consequently prices were low. This continued till the autumn, when an improvement became noticeable.

The crop for the year was 70,278 cwt., against 80,107 cwt. last year, whilst the estimate for 1911 is only put at 65,000 cwt.

Bovril has been awarded the Diplôme d'Honneur (the highest award) at the International Cookery Exhibition, Paris.

Castilloa elastica—Tapping and Yields.

By FRANK EVANS, of the Botanic Department, Trinidad, B.W.I.

THERE appears to be great diversity of opinion, both as to the best method of tapping, and the yield obtainable from, the Central American rubber tree (*Castilloa elastica*).

Latest returns show very clearly that estimates of yields made in former years were far too high.

Cross, in 1881, estimated the annual yield of dry rubber at 12 lb. per tree; another writer stated that the average annual yield of trees in Nicaragua, when tapped spirally, was 10 lb. per tree.

In 1903 and 1904, trees in the Dominica Botanic Gardens gave an average of 1 lb. per tree. The tapping in 1903 was by means of slits cut with an ordinary knife, and in 1904 with a tool used in the East for tapping Hevea. The Dominica experiments of 1905 conducted with a view of ascertaining the best method of tapping, favoured oblique lines cut about 18 in. apart on one half of the circumference of the tree; this agrees with the results of Trinidad experiments.

In 1908, when the writer carried out trial tappings on plantations in the Naparima district of Trinidad, good results were obtained with oblique cuts made with an Hevea tapping knife, also with incisions made with an ordinary 2 in. chisel driven in with a mallet. When using mallet and chisel, care should be taken to drive in the chisel at one level, as an upward or downward cut is apt to split the barks. In 1910, experiments with pricking instruments were made at the Trinidad Experiment Station, the idea being to puncture the whole surface of the trunks to a height of 8 to 10 ft. from the ground. Preliminary tests gave promising results, small punctured areas giving yields amounting to $\frac{3}{4}$ to $2\frac{3}{4}$ lb. dry rubber per tree at one tapping. The chief drawback to the use of pricking instruments is the difficulty of making clean cuts, the wounds usually being rough-edged and heal badly. Another objection is the amount of labour required to continually force in the prickers; but this difficulty could probably be overcome by the use of a portable engine, worked by compressed air, and connected by tubing with the tapping tool. The apparatus must be light enough to be carried and guided by one man. This may seem impossible or difficult, but many agreed that tapping operations of the future will be conducted with the aid of steam, electric, or other power. Experiments in Tobago show that eight to ten-year-old trees tapped with mallet and chisel will give an average annual return of 3 to 4 oz. of dry rubber per tree. A few trees give 1 to $1\frac{1}{2}$ lb. On one plantation it is recorded that some years ago a few hundred ten-year-old trees gave $\frac{1}{2}$ to $\frac{3}{4}$ lb. per tree.

In 1905, experimental tappings with V-shaped cuts on a few thirteen-year-old trees in the St. Lucia Botanic Gardens, resulted in an average return of 11.66 oz. per tree. This yield is similar to that obtained the same year in the vicinity of Bluefields, Nicaragua, where 6,000 trees gave an average of 11.3 oz. dry rubber per tree. Results in Ceylon appear to be less favourable, as, according to the published minutes of the Experimental Station Committee, a tree at Peradenyia, tapped to a height of about 18 ft., gave only 50.90 grammes of dry rubber, although the method of tapping was the full herring-bone on each side, inflicted with mallet and chisel.

Reports from Mexico show the yields in that country vary from 3 to 12 oz., according to the age of the trees. The tapping method in most general use is the long V-shaped cut; but as the apex of the V does not heal well, this system of tapping leaves much to be desired, and is being discarded by the more advanced Mexican rubber planters. Dr. Olsson-Seffer, who has made an exhaustive study of the Castilloa tree, recommends the half herring-bone system of tapping, which consists of a longitudinal channel into which oblique cuts lead from one side only, and so, whilst the full area to be tapped is covered, the tree suffers less than by the V cuts.

The Application of Fertilizers or Manure in Liquid Form.

WHEN publishing our "Fertilization of Tea"* we had many discussions as to how the fertilizers could be most economically and equally supplied to the tea plants, since, if applied dry, the quantity to go to each of the many thousands of plants needing attention would be so small that it was doubtful if the patience, even of the Eastern coolie, would last out a single application, much less a series of them. On the other hand, it is of the utmost importance that no plant be missed over on the one hand, or receive more than its share on the other. To issue these instructions is easy enough; to see that they are properly carried out is quite a different matter.

At the time we issued a slip with the book urging the use of pumps and hose for distributing the fertilizers in liquid form. The desired quantity per 100 gallons of water could be mixed and dissolved in the water, the basic slag alone would need to be kept in suspension, and then the coolie instructed to distribute the water to the desired number of plants per 100 gallons. A paragraph in the *Natal Agricultural Journal* describes a simple device, taken from "Hoard's Dairyman," for getting liquid manure out of a cistern by means of a 3 in. galvanized iron bilge pump, with leather valves and a leather sucker. The amount of liquid to be delivered can be regulated by the valve. The plug valve is the easiest kind of valve to clean should it become clogged. The pump must not be left in the cistern when done with, but should be taken out and cleansed and washed. With an outfit of this kind two men can pump and distribute 30 gallons of liquid manure (*i.e.*, we take this to mean excreta) in about two hours, but dissolved fertilizers would be distributed more speedily. In any case the whole matter is worthy of careful attention, as it is undoubtedly a great deterrent to liberal applications of fertilizers to large areas of trees or plants when the manure has to be applied in dry form, and in centres where the rainfall is uncertain as in India. Again, it is most desirable that the manures should be applied in such a form as can be most easily assimilated by the trees. This matter alone (of applying fertilizers during dry spells) calls for the introduction of some method of the liquid application of manures in India, where they are undoubtedly needed.

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* By W. C. Cowie, B.Sc. Price 2s. 6d. TROPICAL LIFE Publishing Department.

The Advantages of Smoking in the Preparation of Plantation Rubber.

The London correspondent of the *Times of Ceylon* reports that in conversation with a well-known member of the Rubber Growers' Association recently, he was told that the chemical expert, Mr. Morgan, sent out to Malaya by the Association, had been conducting a series of experiments in connection with smoking plantation latex. The outcome of them, he was told, has been to demonstrate conclusively the benefits derived thereby, and it is asserted that the more "smoking" the latex receives, the better the result. The authority above referred to also informed me that some samples of smoked sheet had, when chemically tested, compared favourably with indigenous fine hard. In face of this it will be interesting to watch the success of such machines as the "Da Costa" coagulator, which have been adopted by one or two well-known estates in the East. Meanwhile smoked rubber runs a better chance of escaping the heavy duty in Russia imposed on plantation rubber by the Custom House authorities, who declare that all smooth rubbers in the form of biscuits and sheets are "prepared" or "manufactured." On account of this, "prepared" rubber pays roughly 5½d. per lb., whereas ball, or even plantation rubber with a rough surface, pays only 1d. per lb. Rough crêpe in any form, we believe, escapes the heavier duty.

The Question of Wide Planting in Rubber.

Mr. H. A. Wickham, who brought the original Pará rubber seeds from the Tapajos plateau, up the Amazon, as told in his sketch as "Our Friend" (see March, 1909, issue), has been visiting Ceylon, and expressing his views on the advantages of wide planting. In doing so he apparently bases his opinion on the experience he gained in Brazil, where, as on the Monte Alto, he found the big, full-grown Hevea trees flourishing in all the vigour of native wildness. According to the *Times of Ceylon*, "Mr. Wickham believes that he has converted a large percentage of the Ceylon planters to the view that wider planting would be advantageous to their trees. In almost every place he visited in the Kelvani valley he found that the roots were interlaced. This confirmed him more than ever in his views. He disagrees that close planting saves the weeding bill, and contends that with bigger heads the trees would give denser shade even at two and three years old. In Ceylon hardly anyone has seen the Hevea tree growing under natural conditions, and they do not realize the class of tree it is. In close planting the trees engage in a race skyward, and do not grow big heads with corresponding stems and root area. Asked as to the relative strength of the rubber obtained from trees of 20 in. in girth, some of which had reached that size in four years, while others had been growing for eight years, Mr. Wickham expressed the opinion that the strength would be the same, but that the latex of the older trees should be denser and consequently would have to throw off less moisture—in other words, would produce more rubber if they produced as much latex."

Correspondence.

To the Editor of Tropical Life.

Sir,—As you have always spoken favourably of the work done by the British Cotton Growing Association, I take it that you feel they are a concern that should be supported. I agree with you in theory and am very pleased to see the increased supplies of cotton that they claim they have been the direct cause of being produced for the Lancashire looms.

The only point, in reading the sixth annual report just to hand, that I feel diffident over as a shareholder, is the very small profit they still show (£1,385 as compared with a deficit of £14,421 in 1909, and a deficit of £31,647 in 1908). Surely with a £10,455 income and expenditure account, and £323,897 capital paid up, the Association ought to show a bigger profit than £1,385 in its sixth year of work. I am afraid that the management of a commercial undertaking that showed such poor results with so much money at their disposal would long ago have been asked to resign their positions. Although the British Cotton Growing Association may be a philanthropic concern run for the benefit of Manchester, it is run with public money, and furthermore, if it is ever to do permanent good to Manchester, it must be run to pay the same as any privately-owned concern, or else its object will never be achieved.

Yours very truly,

A Shareholder.

To the Editor of Tropical Life.

Dear Sir,—As manufacturers of water sterilizers, it has been brought to our notice by several rubber experts that the use of our apparatus may be of considerable value to planters in the preparation of raw rubber for market by securing perfect freedom from all enzymes and micro-organisms, capable of producing deleterious effects by oxidation in the product as prepared for the market.

While the crude rubber is sterilized by the application of heat, preparatory to the removal of foreign bodies embedded in it, it is of equal importance that the water employed in washing should also be sterilized, otherwise there is a practical certainty that the rubber will be again infected by bacteria. When raw water is employed, as is almost invariably the case, there is certain to be some deterioration in the rubber, which progresses at a variable rate, according to the suitability or otherwise of surrounding conditions, such as temperature, moisture, &c.

The use of a water sterilizer eliminates altogether the possibility of such change, and rubber thus treated can be relied on to remain afterwards in a thoroughly sound condition. All micro-organisms are destroyed, and the action of enzymes inhibited. The water remaining in the rubber is quite harmless, and incapable of giving rise to oxidation. Probably this result, especially in the cheaper grades, will lessen the cost of preparation, as it will no longer be necessary to remove the residual moisture to the extent that is now usual.

We make apparatus to supply any quantity of sterilized water, from 50 gallons to 5,000 hourly and upwards, and the employment of one of our apparatus in connection with the machinery of rubber manufacture

has been fully worked out, so as to present no difficulty in its installation. The cost is comparatively trifling, and the apparatus requires no more attention than an ordinary domestic fire. Moreover, water of any required temperature may be obtained from the sterilizer, or it can be set to yield a constant current of sterile water which will vary no more than one or two degrees in temperature. The sterilizer can be adapted to any kind of fuel.

The price of an apparatus is so small as compared with the advantages it offers that we feel sure it will be of interest to your readers, and we respectfully ask you to give us an opportunity of sending them the fullest particulars; it is for this reason that we should be glad if you can find space in your journal to bring the matter before their notice.

Yours faithfully,

For Edwin Cooper and Co., Ltd.

P. G. Griffith, D.P.H., Cambridge.

86, Leadenhall Street, E.C.

Among the awards at the important exhibition just closed at Allahabad, U.P., India, was a gold medal to our friends the Pulsometer Engineering Co., Ltd., of Reading, for the excellence of their water-raising and pumping machine. We were glad to hear of this, as India is devoting much-needed attention to the question of water-supply and irrigation schemes, and special prominence was given at the Exhibition to machinery necessary for the raising and distribution of water. We feel, therefore, that if the Pulsometer Company has gained so high an award as the gold medal, they must have thoroughly deserved it.

"Tropical Life" at the Play.

If, like ourselves, you are not admirers of Smart Sets, *jupes-culottes*, and jam-pot hats, you can easily imagine the pleasure we experienced in paying a call at the Playhouse (Charing Cross) to see "Cousin Kate" again. Some people "grow younger as they grow older"; we do not. Miss Ellis Jeffreys as "Cousin Kate" certainly does. Surrounded by the same old friends as when she was at the Haymarket eight years ago (except that Miss Vera Coburn takes the part of Jane, the maid, and Master Stephen Thomas was a very good Bobby Spencer), Miss Jeffreys with Mr. Cyril Maude as Heath Desmond, the genial but rather fickle Irish artist, delighted everyone, and you felt that, for once in his priggish existence, the Curate (Mr. Rudge Harding), in clearing the way by pairing off with Desmond's former fiancée, Amy Spencer, did some good to his fellows, particularly Cousin Kate and Heath, by enabling them to make a match, which they did with amazing alacrity. Where "Cousin Kate" always delights her visitors is that she, and all connected with her, not forgetting Miss Carlotta Addison as Mrs. Spencer (distracted between her daughter's love affairs, her admiration and affection for Kate, and her justifiable anxiety lest her one fowl would not "go round" to appease the appetite of six healthy people) seem simply born to their parts, so that you have difficulty in imagining them as being anything different. Miss Jeffreys' career, if we remember rightly, began with Sir Charles Wyndham at the Criterion, but of all her plays we like her best in her impersonation of "Cousin Kate," as she makes the character so delightfully refined and womanly.

Manuring Land to Improve Stock.

Experiments in the manuring of poor pasture land for feeding sheep were commenced in 1896 under the supervision of Professor Somerville. A report brought up to date on the results obtained by these experiments was published in January, and may be said to show (1) that certain well-marked types of poor pasture land may be so improved by the use of phosphatic manures, and especially by the application of basic slag, as to enable the land to carry a much larger head of stock than before; and (2) that this improvement can be effected at a relatively small expense, and usually results in a substantial profit.

Although the report refers only to sheep, we would recommend all stock-raisers to secure a copy, as it should certainly lead them to carry out similar experiments for cattle as well. The report is issued as Supplement No. 5 to the *Bulletin of the Journal of the Board of Agriculture*, vol. xvii, No. 10, January, 1911 (R. Clay and Sons, Ltd., 7-8, Bread Street Hill, Queen Victoria Street, London, E.C.), price 4d. post free, and in the summary we are told that:—

Basic slag applied as a single dressing at the rate of half a ton per acre, has generally proved a most effective agent in improving the feeding value of pasture, and its effects are not nearly exhausted at the end of nine years.

It has proved much more profitable to apply a heavy application of basic slag as a single dressing, than to divide it into two equal portions and apply these with a three years' interval.

A repeated dressing of basic slag has, however, had a marked effect in some cases, and the productiveness of slagged pastures that are showing signs of exhaustion can be rapidly improved in this way. The action of a repeated dressing appears to be more rapid in many cases than the action of the first dose.

Basic slag put on in the middle of June had much more effect than the same quantity applied in winter. Whether such results will be general can only be determined by further experiments.

Where a direct comparison has been made between the effects of equal quantities of phosphoric acid derived from basic slag and superphosphate respectively, the former manure has always produced the greater amount of live-weight increase. When the cost of the manure is taken into account, the profits from the use of basic slag have always been much greater than those from superphosphate.

Dissolved bones compare badly with basic slag and superphosphate. This is doubtless due to two reasons: (*a*) the slower action of part of their phosphate, and (*b*) the presence of nitrogen. But the nitrogen of dissolved bones, being less active than that of sulphate of ammonia, the general effect on the sheep of the dissolved bones has been better than that of a mixture of superphosphate and sulphate of ammonia. The use, however, of dissolved bones on pasture would seldom appear to be justified, and especially so as their phosphoric acid costs more than the same substance in basic slag.

Plant Protection.

Writing on the above subject, under a sub-heading of "Ceylon Considered ahead of Malaya in Legislation," the *Malay Mail* goes on to say:—

"In the 'Agronomie Tropicale,' the monthly organ of the Société d'Etudes d'Agriculture Tropicale, a magazine of much value to all planters in India and the East, there is an interesting review of legislation against the dissemination of insects and fungi injurious to tropical plants, by Dr. C. Willis, Director of the Royal Botanic Gardens, Peradenyia, Ceylon. Legislation of this order, we learn, was first initiated in the United States. It is only recently that similar legislation has appeared to any great extent, and been properly enforced, in the Tropics. The benefits are already, however, becoming very marked. The ravages of the coco-nut beetle, that once threatened to ruin coco-nut cultivation in the Straits Settlements, have been checked, and at the same time a general improvement is observable in cleanliness of cultivation everywhere. In Ceylon, we are told, legislation has gone very much farther than in the Federated Malay States. The ordinances are well designed, and effectively enforced. The importation of seeds and plants tainted with fungus, or likely to introduce insect pests, is prohibited, though the certificates of properly-qualified scientific officers of bodies such as the Indian Tea Association, can secure exemption where the goods have a clean bill of health. Even so, under the Ordinance of 1901 all imported citrus seed, cotton seed, Indian potatoes, and living plants must be treated with hydrocyanic gas in the fumigatorium provided at the port. It is the same with fruit and seeds imported from Australia. The result has been that in the last ten years no fresh insect or fungoid pests have been introduced in Ceylon. In India a strong fight is being made against diseases and pests. It is a hard fight, very hard, but any epidemic disease is promptly taken in hand, studied and checked, as the palmyra disease in the Godaveri Delta was checked, when the Government destroyed the heads of the affected palms. The Government in India acts directly. In Ceylon, and still more in the Straits, the main responsibility is left with private persons, acting in concert through local plant pests boards." As this important matter is discussed at considerable length under several sections in the book recently published by our Editor on "Soil and Plant Sanitation," it is to be hoped that, with the Press so keen on the matter, lasting reforms will be brought about.

Coffee Notes.*

The *Coffea canephora*, of which *C. robusta* and *C. laurentii* appear to be varieties, has a special value to planters, since, without being absolutely immune to the *Hemileia vastatrix*, the *C. canephora* and its sub-varieties offer great resistance to the disease, besides being heavy yielders at an early age. It is on this account that the Dutch are so strongly advocating the planting of these coffees in preference to *C. arabica*, and even the more vigorous *C. liberica*, both of which have proved unable to resist the *Hemileia* in Java.

When planting these coffees, especially if disease is known to be about, the plants should be liberally manured, in order to have an ample supply of plant-food and nourishment to draw on when building up their wood and leaves, otherwise exhaustion sets in and the trees are extremely susceptible to disease. Exhaustive experiments in Brazil, Madagascar, Indo-China, and especially in Java, suggest the following quantities per tree, according to age:—

	Phos. acid.	Potash.	Nitrogen.
Up to 4 years	1·13	10·72	4·48 grm.
4—8 ,,	8·88	24·90	16·20 ,,
9—20 ,,	7·15	20·81	13·20 ,,
20 and over	4·30	13·85	2·31 ,,

1 kilo = 1,000 grm. is 2·20 lb.

Compared with the above supplies proposed to be put back into coffee soils, the following is supposed to be abstracted therefrom in every 1,000 kilos. of coffee removed from the trees at Deli (Sumatra), the ages of which are, however, not mentioned:—

	1,000 kilos coffee as exported.	3,800 kilos as picked to make 1,000 as exported.
Phosphoric acid	2·897	3·974 kilos.
Sulphuric acid	·490	1·652 ,,
Lime	1·486	4·846 ,,
Potash	14·441	28·720 ,,
Nitrogen	16·800	23·856 ,,
Magnesia	2·299	3,492 ,,

Why Sugar-canes Need Potash.

"As is well known," writes Mr. Herbert M. Shilstone in the *Louisiana Planter*, "no plant can thrive unless mineral constituents are provided, and these mineral constituents form what is known as the ash. The ash is the residue obtained when a plant is burned, and if some sugar-cane stalk is burned in this way, an ash will be obtained which constitutes from 0.50 to 1.0 per cent. of the original stalk. Examination of this ash shows that it is very rich in potash as are all sugar-producing plants, it also contains a considerable amount of silica, which is necessary to give the plant resistance by forming cells whose walls are tough. The following table from Bulletin 91, Louisiana Experiment Station, by Browne and Blouin, shows the constituents of the ash, from leaves, stalks and roots of a typical D.74 cane."

Composition of the Ash of Sugar Cane.

		Ash of leaves. %	Ash of stalk. %	Ash of roots. %
Potash	K_2O	31·25	38·23	17·39
Soda	Na_2O	1·17	1·30	0 85
Lime	CaO	5·90	5·19	3·45
Magnesia	MgO	5·11	5·76	2·61
Iron Oxide	Fe_2O_3	1·45	1·13	3·60
Alumina	Al_2O_3	1·03	0·25	4·70
Silica	SiO_2	30·32	15·70	49·52
Phosphoric Acid	P_2O_5	7·25	5·27	3·99
Sulphuric Acid	SO_3	11·29	18·47	9·15
Carbonic Acid	CO_2	1·10	2·70	0·45
Chlorine	Cl	3·08	4·55	0 98
Carbon	C	0·14	0·57	2·30
Total		99·09	99·06	98·99
Deduct O=Cl		0·70	1·02	·22
		98·39	98·04	98·77

* Based on the Report of the Cie. du Kasai.

Manuring of Hevea Rubber.

Although the application of manures is a comparatively recent introduction into rubber plantations, experiments have already shown that their judicious use is followed by good results and improved yields. It has been established that when the soil is supplied with a well-balanced plant-food the growth and the vigour of the rubber trees is considerably increased, rendering them at the same time more capable of resisting pests and injuries from other causes. Properly manured young trees allow tapping operations to be commenced six to twelve months earlier, whilst similarly treated old trees show a greater increase in girth and renew their bark more quickly and more thoroughly than the trees grown on unmanured land. Experiments have further shown that owing to the application of manures the flow of latex was more vigorous, and that the coagulation of rubber from this latex took place more promptly. If, on the other hand, it is borne in mind that the fertility of the soil of a plantation is reduced not only by the amount of plant-food removed in the latex, but to a much larger extent by the considerable quantities of fertilizing ingredients which are continuously required for the renovation of the bark, for the growth of new wood, and for the production of leaves and fruit, it is obvious that sooner or later even the richest soil becomes exhausted unless adequately manured. It therefore follows, in the light of the above results, that it is to the advantage of every planter to prevent soil-exhaustion on his plantation, and at the same time to encourage increased yields of rubber.

Unfortunately, on nearly every plantation the production of farmyard manure and compost, even if all the waste is carefully collected, is insufficient to meet the manurial requirements of the plantation. Therefore, in order to maintain or to increase the fertility of the soil, the bulk of, if not all, planters must avail themselves of the use of artificial manures, especially as they can be made up to any formula and so enable the owner or manager to apply just those fertilizing ingredients that are needed.

Nitrogen in a readily available form is supplied by nitrate of soda, nitrate of potash, nitrate of lime, sulphate of ammonia and calcium cyanamide or nitrolim. Nitrate of soda, nitrate of potash, and nitrate of lime contain nitrogen in the form of nitric acid—which is directly assimilable by the plants—dissolve easily in water, and are not absorbed by the soil. They should therefore be applied in light dressings only, in order to prevent their being washed out of the soil. Nitrate of soda contains 15.5 per cent. and nitrate of lime 13.9 per cent. nitrogen. Nitrate of potash contains 13.5 per cent. nitrogen and 44 per cent. potash, and should—owing to this high percentage of potash—only be used on soils which are deficient in potash. Sulphate of ammonia and calcium cyanamide contain 20 per cent. and 18 per cent. nitrogen respectively, but in such a form that they must undergo a change into nitric acid in the soil before they become an available plant-food. In the Tropics, however, this change takes place very speedily, so that there is scarcely any difference between the effectiveness, nitrogen for nitrogen, of nitrate of soda, nitrate of lime, sulphate of ammonia, and calcium cyanamide. The choice between them is dictated more by the character of the soil and the price of the fertilizers per unit of nitrogen. Whereas calcium cyanamide and nitrate of lime are suitable for all soils, though preferable for those poor in lime, sulphate of ammonia should only be used on soils well provided with lime. Nitrate of soda can be profitably used on almost all soils, excepting light sandy soils, but shows its best effects on loamy soils.

All these nitrogenous manures are quick acting, and their nitrogen will be absorbed by the rubber tree within a short time* of their application. It will therefore be advisable to meet the continuous requirements of the rubber tree in nitrogen by applying a portion of what is required by means of some less quickly available manure, such as oil cake, or blood meal.

The best-known phosphatic manures are superphosphates and Thomas' phosphate powder or basic slag.

The manurial value of the superphosphates (ordinary and concentrated) depends upon their content of phosphoric acid soluble in water and in citrate of ammonia solution. Whereas the percentage of water-soluble phosphoric acid ranges from 12 to 20 per cent. in ordinary superphosphates, the concentrated superphosphates contain 40 to 43 per cent. water-soluble phosphoric acid, and 2 to 3 per cent. phosphoric acid soluble in citrate of ammonia solution.

If superphosphate is applied to the soil, its phosphoric acid, being soluble in water, becomes disseminated throughout the soil, and is there absorbed by other soil constituents, as lime, magnesia, iron, and alumina, forming phosphates which are insoluble in water. In soils containing a fair amount of lime the water-soluble phosphoric acid is precipitated into phosphate of lime, which supplies the plants with available phosphoric acid; but on soils poor in lime, the water-soluble phosphoric acid is either subject to being washed out of the surface soil, or is absorbed by the oxides of iron and alumina forming compounds, the phosphoric acid of which the plants can only assimilate with the greatest difficulty. The use of superphosphates should therefore be limited to soils which are not deficient in lime; on these, 1 lb. of phosphoric acid in ordinary superphosphates has the same effect as 1 lb. of phosphoric acid in concentrated superphosphate.

Thomas' phosphate powder, a by-product in the manufacture of steel free from phosphorus, contains 15 to 20 per cent. phosphoric acid, 40 to 50 per cent. lime, and 4 to 5 per cent. magnesia. The phosphoric acid in Thomas' phosphate powder, although insoluble in water, is easily soluble in weak acids, and therefore readily assimilated by plants. In genuine Thomas' phosphate powder 80 per cent. and more of its phosphoric acid is soluble in a 2 per cent. citric acid solution, which portion is considered quite as available as the water-soluble phosphoric acid in superphosphate. As the phosphoric acid in Thomas' phosphate powder does not undergo any changes in the soil which might reduce its availability, the use of

* The effect of an application of nitrate of soda upon the flow of latex in Ceará trees was manifested within 48 hours. (See *Hawaii Bulletin*, No. 16.)

this phosphatic fertilizer is not restricted to any particular class of soil, but can be applied with advantage to all soils. Its effects are most marked on soils deficient in lime, and on soils containing an excessive quantity of organic matter, in which cases the effects of the Thomas' phosphate powder are due not only to the phosphoric acid but also to the lime it contains. The latter can be easily assimilated by plants, and, like every other form of alkaline lime, improves the mechanical condition of the soil, promotes the oxidation of the nitrogenous reserves, brings the soil potash in solution and helps to neutralize and render harmless the organic acids of soils rich in humus.

The principal potash manures in use are sulphate of potash and muriate of potash. The former, containing 48 to 52 per cent. potash, is especially recommended for soils deficient in lime, whereas the use of muriate of potash, containing 50 to 59 per cent. potash, is better limited to soils containing an ample supply of lime. The sulphate of potash, being less soluble than the muriate of potash, is better retained by the soil, and in very wet districts, although a little dearer, is a more profitable source of potash than muriate of potash.

If the soil of the plantation is so poor in lime that this deficiency cannot be made good by the continued use of Thomas' phosphate powder as phosphatic manure, the application of burnt lime or ground limestone becomes necessary.

As to the quantities of fertilizing ingredients to be applied to rubber plantations, this depends not only upon the different requirements of the rubber trees at their various ages, but also upon the condition of the soil. For plantations on fair average soils, showing neither a marked excess nor a marked deficiency in either of the three fertilizing ingredients—nitrogen, phosphoric acid, and potash—the supply of plant-food may be considered as well balanced if these fertilizing ingredients are applied in the proportion of 1 part nitrogen, 1 to 1.5 parts phosphoric acid, and 1.5 to 2 parts potash; and, therefore, for trees old enough to be tapped, which require about 40 lb. nitrogen, 60 lb. phosphoric acid, and 70 lb. potash per acre, the following mixture may be safely recommended to ensure good results:—

1½ cwt. nitrate of soda (or 1⅓ cwt. sulphate of ammonia).
1½ cwt. oil cake.
3½ cwt. Thomas' phosphate powder (or 1½ cwt. concentrated superphosphate).
1¼ cwt. muriate of potash.

All these manures may be mixed together, with the exception of Thomas' phosphate powder and sulphate of ammonia.

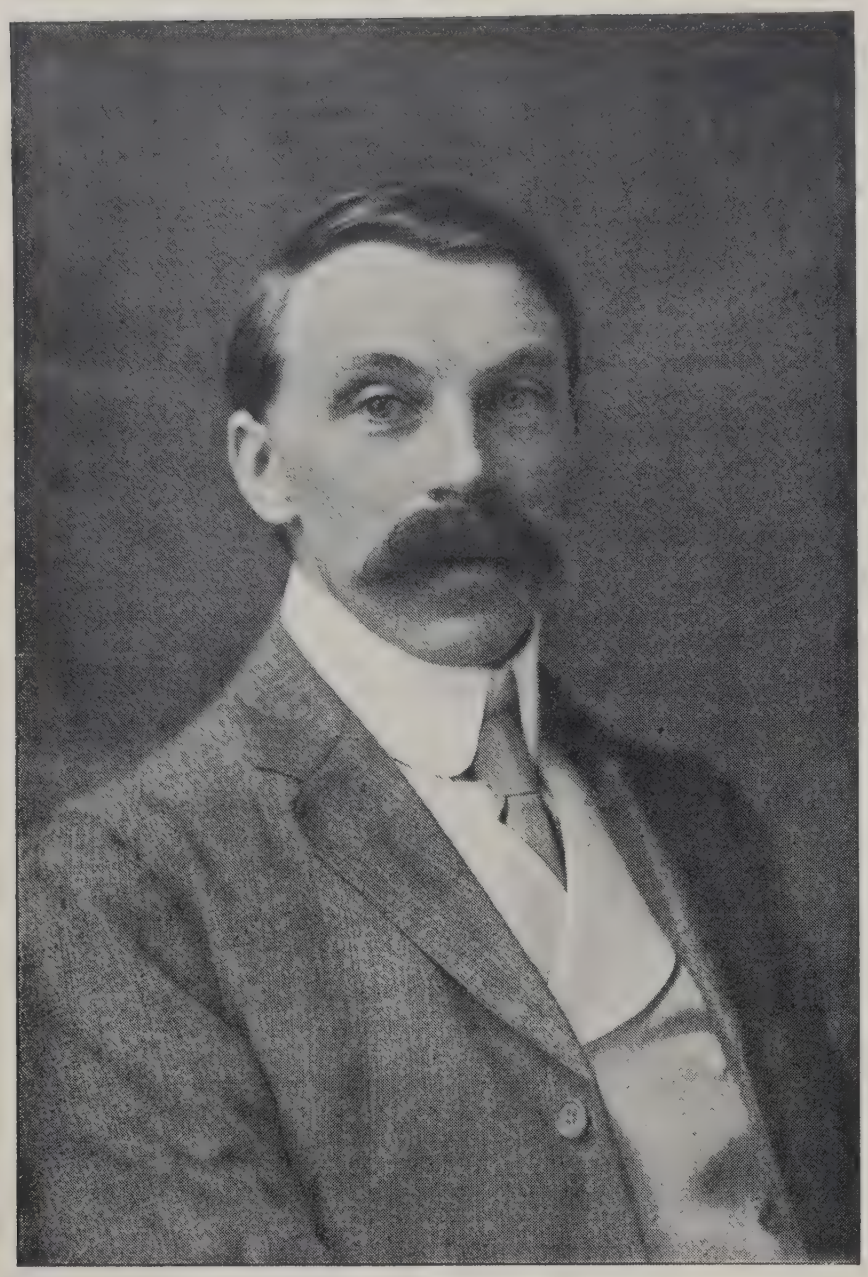
Where, however, plantations are laid out on poor soils, the above quantities should be increased by one half; and a similar increase is advisable as regards the potash supply on light soils, whereas on strong soils—which are, as a rule, poor in phosphoric acid and lime—5 cwt. Thomas' phosphate powder per acre will meet the requirements of the rubber tree better than either of the phosphatic dressings suggested above. Furthermore, if the trees show a good leaf growth, the nitrogenous dressing may be decreased by one-third, whereas if the leaf growth is weakly, better results will be obtained by increasing the nitrogen supply one-third.

As to the manuring of young plantations, the planter will be well advised to make use of the nitrogen collecting power of leguminous plants, which, grown between the rows, and forked in when they are in flower, are able to meet the young rubber trees' requirements of nitrogen. In order to enable the leguminous plants to develop vigorously, and to accumulate an increased quantity of nitrogen, it is, of course, necessary to manure same with phosphoric acid and potash, say, 2 to 3 cwt. Thomas' phosphate powder and ½ to ¾ cwt. muriate of potash per acre. Such "green manuring" may be practised as long as the growth of the leguminous plants does not hinder the roots of the rubber trees in their proper development.

When, however, green manuring is not adopted, the nitrogen has to be applied by means of artificial manures. Young trees should receive, during the first year, a manuring with ⅜ oz. of nitrate of soda, ⅜ oz. oil cake, 1¼ oz. Thomas' phosphate powder, or ½ oz. concentrated superphosphate, and ⅜ oz. muriate of potash per tree, these quantities to be doubled from year to year till the trees are fit for tapping, when the full manuring suggested above may be adopted annually.

The artificial manures are to be sprinkled around the trees. Until the young trees reach their fifth or sixth year, it is a better practice to manure them singly, by distributing and forking in the manures around the stem at a distance of from 1 to 1¼ ft. for each year of the tree's growth. After the sixth year the soil of a plantation is so thoroughly permeated by the roots of the trees that the artificial manures can be distributed over the whole plantation.

THE "'Wellcome' Exposure Record and Diary" continues year after year to hold its place in the affections of photographers all over the world. It is essentially a book for the pocket, and is the most handy epitome of photographic art and practice, up-to-date, that one could wish to possess. The articles contained in the literary portion of the 1911 edition, which is just published, are all of a highly interesting and useful character, and serve to help photographers in the tropics and elsewhere over the technical difficulties of exposure, development, &c. They include directions concerning negative making, factorial, time, machine, tank, or stand development, bromide printing, toning, and intensification. Nor are such processes as colour photography and the making of ozobrome or bromoil prints forgotten. In the latter portion of the book the problem of exposure is taken up in a very thorough and ingenious manner. The facts and data which bear upon this important subject are carefully tabulated, correlated, and arranged. To the inside of the cover is attached the "Wellcome" Exposure Calculator with its movable disc which enables the correct exposure to be determined under all conditions of light and scene by a single turn of the scale. For the convenience of its world-wide readers and users the "Wellcome" Exposure Record and Diary is published in three editions, namely, the Northern Hemisphere and Tropics, the Southern Hemisphere and Tropics, and the United States of America.



Tropical Life Friend.—No. 71.

Mr. Rudolph D. Anstead, B.A.Cantab.

Planting Expert and Scientific Officer to the United Planters' Association, Southern India.

Although just off for a two months tour through the rubber districts of Travancore and Cochin, "Our Friend," last autumn, was kind enough to supply us with the valuable contributions and comments that are interspersed in our book on cacao and rubber cultivation, which we appreciate all the more since we know how busy Mr. Anstead was in bringing Southern India up to his ideal as a producing centre. Those of us who regularly subscribe to the *Planters' Chronicle*, the organ of the U.P. Association of Southern India, can easily realize the amount of work "Our Friend" puts in in the course of twelve months.

Born in 1876 at Wisbech, Cambridgeshire,* "Our Friend," did well both at school and college. Educated at Giggleswick School, Yorkshire, he specialized in science and mathematics, studies which have since proved very useful to him and to those who have had the advantage of his services as a scientific expert. This work, however, did not succeed entirely in monopolizing Mr. Anstead's time and attention: his school career being one of many excellent examples of those who work the hardest, playing the best. The same year (1896) that he graduated at Cambridge (Christ's College) saw "Our Friend" head of the school and Captain of the Cricket XI. The next year (1897) Mr. Anstead secured the College Prize for Chemistry, and also gained a Scholarship. Two years later (1899) he won an Honours degree in the Natural Science Tripos, taking for his subjects Chemistry, Botany, Physics, and Mineralogy. He spent the chief part of his fourth year at college in reading up chemistry and agriculture. Leaving college he accepted the post of chemist in some seed-crushing mills and cake and fertilizer works, where he remained until 1901, when he came to London, also as chemist, and carried on research work in connection with the Barbados Manjak industry. This was probably the cause of his going out to the West Indies, which he did in November, 1901, on being appointed assistant to the Government chemist at Barbados (W.I.) and placed in charge of the rum refinery, as well as of the analyses of sugar, food and drugs, fertilizers, &c. In 1903, he became assistant chemist to the Imperial Department of Agriculture (W.I.), taking over the sugar-cane experiments, the results of which work were much appreciated. Sea Island cotton having meanwhile been introduced, Mr. Anstead carefully watched its cultivation and preparation as well as the pests, &c., attacking the plants. From Barbados "Our Friend" passed in 1905 to Grenada, leaving there in 1909 to go to Southern India. In Grenada Mr. Anstead was at the head of the Agricultural Department, and in that capacity organized an experiment station, started lectures, also arranged for and extended the general educational and advisory work of a large tropical agricultural department, in connection with such crops as sugar, cotton, cacao, nutmegs, spices, coffee, timber, rubber, starches, maize, &c. Besides this he carried on the work of entomologist and mycologist, as well as departmental chemist.

Those who have studied the question of pests are well acquainted with Mr. Anstead's reports in the various agricultural journals, especially the *West Indian Bulletin*, *Agricultural News*, *Grenada Bulletin*, and latterly the *Planter's Chronicle*, Bangalore, Southern India.

At and around Bangalore "Our Friend" continues to advance his reputation as planting expert, and scientific officer to the United Planters' Association of Southern India, and his work apparently extends throughout the southern portion of the peninsula. Here he is studying rubber, coffee, tea, cardamoms, and pepper, not only in Travancore but also in Mysore, Wynaad, the Nilgiris, Cochin and Coorg, with his headquarters and laboratory at Bangalore. It is generally agreed that Mr. Anstead is a coming man, who will soon be "right there" in the front of the tropical planting world.

* To-day the centre of an interesting experiment in co-operative fruit-production, and distribution.

Dr. Lewis H. Gough has issued through the West Indian Department of Agriculture two useful reports that should be studied by all sugar-cane planters. These are: (1) "Results obtained in the Study of the Froghopper during the wet season of 1910"—a report Dr. Gough drew up to give a general review of the life-history of the froghopper, its effects on the canes, and the methods of controlling the insect; (2) "The Palm Weevil as a Sugar-cane Pest, its history and possible remedies." Both will be valuable addition to our entomological shelves.

Business Notices.

1.—The address of Tropical Life is Messrs. Bale, Sons and Danielsson, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All **literary communications** should be addressed **to the Editor,** and accompanied by the necessary stamps for their return if not accepted.

3.—All **business communications and payments**, either for subscriptions or advertisements, should be sent **to the Publishers** of Tropical Life. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is **Ten Shillings** per annum, may commence at any time, and is payable in advance.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed to the Manager of the Department.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

May, 1911.

The Truth about Mexico.

We have often asked ourselves, "What is the matter with Mexico? Why, with all the millions of American and European gold* poured into that country does it not make greater agricultural and commercial progress?" We keep hearing of the wonders that Mexico, like its rubber estates, is *going* to offer to the world; *going* to offer, but which, up to now, have not made their appearance. Is it because the Mexican land owner exploits his fellow-countrymen harshly and unfairly, and does not give them a fair share of the riches, agricultural or mining, that Mexico can produce so freely, if the labour supply at her command is properly trained and adequately remunerated for obtaining them? If it is so, then we are not surprised that Mexico lags behind, and she will never do anything else until such a state of affairs is altered. Individuals may grow exceedingly rich, but the country, as a whole, will only stagnate or go back. Whilst not agreeing with the more extreme of Mexico's critics, we cannot help feeling that there must be some truth in the contention that the land owners, whilst perhaps not brutally ill-using their labourers (*i.e.*, the geese who produce the golden eggs for them), are not treating them altogether fairly, and by keeping them at a low level of comfort, are hampering their future and retarding the progress and prosperity of Mexico itself.

Some very hard things have been said concerning labour conditions in Mexico. At first we compared these rumours and reports to a slight leakage of water easy to rectify, but the articles by Mr. Kenneth Turner have since grown into a substantial book which, if it does not receive the attention and consideration that it deserves, may cause, what is still only a stream, to swell into an overwhelming torrent, capable of sweeping those who dominate Mexican politics and commerce before it, so that they never come to the surface again. In any case Mr. Turner's book marks a critical period in the history of Mexico.*

Always great believers in Mexico as a wealth-producer, when discussing its labour conditions we have never pretended that they were perfect. Mr. Turner evidently does not think so, but he uses means to prove his case which tend, in our mind, to spoil it, and which savour in at least one instance of mere mud-throwing at President Diaz for a matter with which he had nothing to do, and which was a pure accident.† We prefer the broader lines used, as at the close of Chapter 6 when we read: "Mexico is a people starved—a nation prostrate. What is the reason? Who is to blame?"

Mr. Turner does not spare America; on the contrary he directly charges the United States with being the main support of Diaz and his "camarilla." Thus we see on p. 225: "Four times during the past three years the United States Government has rushed an army to the Mexican border in order to crush a movement of the Liberals," and we know of course a similar state of affairs prevailed at the time the book was published, only what Mr. Turner calls Liberals the officials call rebels. In any case this is pure politics, and whether America is justified in interfering we do not pretend to say, although why she should assist Cuban rebels and not Mexican is a little puzzling. If half of what Mr. Turner says is true, the lower classes in Mexico need help even more sorely than did the Cubans or Filippinos when Roosevelt went fighting for them.‡ On p. 214 we are told, this time in italics: "*Most effectively has the police power of the States been used to destroy a movement of the*

* According to the *Financial News* (February 1), "Speaking broadly, the supply of foreign capital which has been drawn into Mexico comes from the following sources: (1) British (including Canadian), $700,000,000—about 60 per cent being invested in railways, 15 per cent in mining, and 25 per cent in agricultural and other industrial enterprises; (2) United States about $1,000,000,000—about 35 per cent invested in railways, 45 per cent in mining, and the balance in other industries; (3) French, Belgian, Dutch, and Spanish—about $300,000,000 invested largely in bank stock, in manufactures, and in wholesale and retail trade. The exports of Mexico exceed the imports handsomely. The total trade for the fiscal year 1908-9 was, in Mexican dollars, $387,633,000, imports being $156,533,000 and exports $231,100,000. The corresponding figures for 1909-10 were: Total foreign trade, $454,913,000: imports, $194,857,000; exports, $260,056,000. The general development of Mexico has been retarded, owing to the fact that large areas of the most fertile land are held by families who have done little to improve their properties and who have been content with the trifling return per acre resulting from unskilled labour. The Government is now trying to convert these often vast estates into small holdings, and to encourage farming on more scientific principles. Mexico also possesses immense deposits of iron ore on the Pacific coast, said to be suitable for the production of high-grade steel."

* "Barbarous Mexico: An Indictment of a Cruel and Corrupt System." By John Kenneth Turner. 292 pages, with index and 48 full page illustrations. Price 7s. 6d. net. Cassell and Co., London (Ludgate Hill), New York, Toronto, and Melbourne, or of Tropical Life Publishing Department, 8s., post free.

† We refer to the death of the woman from sun-stroke in the procession; see illustration facing page 148.

‡ *The Rubber World* (London) is even more emphatic, when it says: "If a tithe of Mr. Turner's revelations be well found, then the sooner Mexico is taken in hand by some power which stands for civilization the better for our common humanity."

Mexicans for the abolition of Mexican slavery, and to keep upon his throne the man who is chiefly responsible for the system . . . the United States have virtually reduced President Diaz to the status of a political dependent, and by so doing have virtually *transformed Mexico into a slave colony of the U.S.A.*" Whatever Mexico does, if America does not sit up and see into this matter, she must never put forth the finger of scorn at Spain any more. On the contrary, Spain may have need to send missionaries to convert the slave-hating Americans to the right path.

The articles as they originally appeared in the magazines were, as far as we can remember, a denunciation of the methods employed on the estates to "speed-up" the Indians to the American-Mexican ideas of a good day's work. In the book, however, the condition of the labourers stands in very secondary importance to the political side of the book. The whole work, if its story deserves any attention, and no one will deny that it does, is a direct attack on the political system that prevails in Mexico: a party, it is alleged, kept in office by bosses who exploit and grossly underpay their labourers. Such matters certainly need attention, not only for humanitarian reasons, but by every nation that is producing sisal, rubber, &c., in competition against Mexico with its alleged underpaid and forced labour.

Some Insect and Fungoid Diseases that Attack the Funtumia Rubber Tree.

By R. Barry Band.

The Funtumia rubber tree is now looked upon as one of the most suitable rubber-producing trees to plant in Tropical Africa; and its being indigenous, is a point strongly in its favour. Many African rubber companies have planted and are continuing to plant large areas on their properties with *Funtumia elastica*. Therefore this may be an opportune time to mention that the Funtumia is not immune to attack from insect and fungoid diseases. Whether damage to an alarming extent has been done by attacks from insects or fungi, in any part of Tropical Africa, appears doubtful, as no record of same has been published; and it is usual to adopt some preventive measure before serious loss is caused.

From Drawing by Catherwood, 1844.] [Reproduced from the *Bulletin of Pan-American Union.*

End View of a Mayas Monastery, Yucatan.

The architecture of Babylon, Assyria, and Egypt seems likely to have been inspired by the buildings of the Mayas and Quiches in Yucatan, whose civilization must have attained its zenith when the inhabitants of the African centres were pure savages.

"All Merida, and all Yucatan," Mr. Turner tells us, "are dependent on the fifty henequen (sisal) kings, who live in costly palaces in Merida. Their slaves are: 8,000 Yaquis, 3,000 Koreans, and between 100,000 and 125,000 native Mayas, who formerly owned the lands which they now work as slaves. The Maya people form 95 per cent. of the population of Yucatan, and had a civilization of their own when Europe was 'discovered,' and it was a civilization as high as the most advanced Aztecs of Mexico, or Incas of Peru." To show how true this is, we reproduce one of several interesting photographs of the beautifully carved buildings that they erected in Yucatan, decades before the coming of the white man. When Cortez landed in 1519, their cities with these beautiful buildings had long been abandoned, and their men, who at one time excelled in architecture, in sculpture, printing, and astronomy, had passed away and been forgotten. *The Pan-American Bulletin* for March, from which we take this photograph, contains a very interesting account of the Mayas Indians of Yucatan (pages 453-468, with 13 photographs and a map or plan).

The following information about some of the insect pests and fungoid diseases at present known to attack Funtumia, with remedial measures suggested, may be of value to those engaged in the cultivation of this important rubber tree.

Insect Pests.

The Larvæ of a Moth (one species has been determined at the British Museum as *Glyphodes ocellata*, Hampton, belonging to Pralidea family). The moth lays its eggs upon the Funtumia leaves; the eggs are small and inconspicuous; they usually hatch out in less than a week into green caterpillars, which crawl about and feed upon one side of the leaf, and when they grow larger they eat holes in the leaf; more commonly eat in from the edge until the whole leaf is devoured. Attacks from caterpillars have been recorded on both young and old trees, and in some cases total defoliation has been brought about by them. This seems to occur regularly to the Funtumia trees in Ceylon, but only occasionally to trees in cultivation in Tropical Africa. Where the attack is severe and the growth of the trees hindered, remedial measures are necessary. Small boys may be employed to handpick the caterpillars from the small trees, but the spraying on of an insecticide may be found cheaper and as effectual a remedy. Bordeaux mixture (a compound of copper sulphate, lime, and water) has been applied to attacked trees in the Gold Coast with successful results, as shown in the Agricultural Report of that Colony. London purple and Paris green, both stomach poisons, are also useful insecticides and not expensive. Where the older and tall trees are attacked, it will be necessary to fit a longer tube to the sprayer to enable the operator to spray the higher foliage successfully. These long tubes are advertised in Tropical Life.

(2) *Girdling Beetles* (belonging to the super-family Cerambycides, sub-family Lamiidæ, Jemmet) have been doing damage to Funtumia trees in Ashanti and the Gold Coast. (See Agricultural Report of that Colony for 1909.) Attacks from these girdling beetles are of a more serious nature than attacks from caterpillars. The girdling beetles attack healthy trees, but the larvæ of the beetle causes more damage than the beetle itself. The beetles feed on fairly young bark, eating irregular long patches on the young stems, when not feeding it remains perfectly still resting on its two hind pairs of legs, with its fore legs extended forward and its face downwards. As soon as disturbed it drops to the ground, folds its legs together underneath, with its antennæ extended over its back, and remains motionless as if dead. It never flies away and is easily caught when seen. It is seldom to be found on sickly trees and never in great numbers. It lays its eggs in punctures made in the bark at base of tree. The larvæ tunnels downwards through the larger roots and takes a long time to undergo its stages. The presence of the larvæ at work in the roots is only ascertained when the tree begins to show signs of ill-health, when it may be too late to save the tree. Drastic measures are necessary to check the increase of this girdling beetle. Catching the beetles by hand and destroying them, destroying the larvæ or grub in their burrows or tunnels by a piece of flexible wire or by injecting kerosene or sanitary fluid into their tunnels and closing up the hole with a mixture of clay and tar. Attacks from this beetle are not confined only to the Gold Coast; in Uganda ravages from a species of girdling beetle have been noted.

(3) *Termites* (*Termes gestroi*), commonly termed white ants, are troublesome pests to many economic crops, and the Funtumia is no exception. They usually attack the stem where they can get easily underneath the laticiferous system without having to eat their way through; they then work upwards, making their channels throughout the wood, leaving the bark intact to provide the necessary protection against the light. Where this pest has become a nuisance, searches should be made for their nests, and where they cannot be dug up and destroyed, kerosene or an abundance of hot water should be poured over them; this will destroy the nest, and if the queen termites are killed, the remedy will have been effective. Other remedies are largely advertised and recommended by makers.

Fungoid Diseases.

The number of fungoid diseases attacking Funtumia are not as yet numerous, nor of a very alarming character, but still they are of sufficient importance to necessitate a brief description to assist those unacquainted to distinguish them and prevent their spreading.

(1) Stem disease,* a canker disease noticed first attacking the Funtumia trees in Uganda and named *Nectria funtumiæ*. (Massee, see Kew Bulletin No. 1, 1909.) The trunk is usually attacked about four to six feet from the base. The first obvious indication of the disease is the appearance of a small black patch in the bark, which gradually extends until it may cover an area of a square foot or more; in some cases it is only confined to one side of the trunk, in others it may completely encircle the trunk. As the disease progresses, the bark increases in thickness and becomes cracked and rough, and no latex is obtainable from this portion. The cutting edge of the tapping knife, if it comes in contact with the cankered portion, usually gets injured. This canker disease is to be found on plantation trees in West Tropical Africa; it is usually found where the bush is allowed to grow up amongst the trees and also where thick clusters of bananas are allowed to grow between the trees. It is not at present a very prevalent disease, but to prevent its increase, cleanliness of plantation is necessary, and the diseased portions should be cut clean away and the wounded surface protected by tar.

(2) Root disease (*Hymenochæte*, probably *Noxia*, Petch and Massee) is a very prevalent disease in forests, and repeated records have been made of it attacking cacao and hevea trees; therefore it is not surprising that Funtumia has not escaped attack. This disease can always be distinguished by the thick coating of sand and small stones which adhere to the mycelium on the roots, which shows on closer examination light brown slender strands externally and a network of black lines internally. This disease appears to begin on pieces of dead wood or stumps in

* A specimen of this Canker disease may be seen in No. 1 Museum, Kew. *Apocynaceæ* Cases.

the soil and does not appear to spread to other trees unless the roots are in contact. It is doubtful whether this root disease is very prevalent in Funtumia plantations, but constant observation is necessary as no plantation can be said to be free from this fungus. Where trees are found attacked with root fungus, and beyond recovery, they should be removed and burned, care being taken to remove all the diseased roots, the place should then be isolated with a trench eighteen inches deep, and treated with a good dressing of lime. Four or five months should elapse before replanting is carried out. Trees only slightly attacked should have diseased portions removed.

(3) Leaf fungus (*Meliola sp*), or sooty mould, was mentioned in the Agricultural Report of the Gold Coast Colony for 1901 as a troublesome pest, but was got rid of by spraying the trees with Bordeaux mixture. This leaf fungus may become troublesome at times, but it is not parasitic; it appears only to assimilate the honey dew secreted by certain insect pests such as scale (*Coccidæ*), which are hardly ever troublesome enough to demand special treatment.

Parasitic Plants.

In many Funtumia plantations in Tropical Africa numbers of trees are to be seen with mistletoe (*Loranthus sp.*) growing on the branches or the stem of the younger trees. This is a troublesome pest; it should be cut clean away and burned, especially before it has fruited, as the birds usually carry the seed to neighbouring trees where it will ultimately germinate and continue the mischief. All wounds made in the removal of this parasite should be tarred over.

The Cult of the Coco-nut.*

The Tropical Agriculturist for March comments on shipments of coco-nut products from Ceylon during 1910. Of coco-nut oil 594,235 cwt. were shipped, being a record except in 1908, when 629,122 cwt. were exported. A record local price was established in Rs. 605 f.o.b., but since then supplies of soya-beans are considered to have been responsible for lower values in Ceylon, America, and elsewhere. Of coprah 719,262 cwt. were shipped, against 727,698 last year, or 8,436 cwt. less. The highest price realized was Rs. 93.50 at Colombo (Rs.=1s. 4d. about). Estate owners, as a rule, preferred selling their nut crops in shell, as they then realize a quicker return and no risk of a falling market. In this they shared the opinion of the Trinidad (W.I.) planters, who are now realizing $29 per 1,000 for "standard peeled select," in bags of 100, against $4.30 per 100 lb. for coprah ($=4s. 2d.) and 91 cts. gallon for coco-nut oil. As we have the figures by us, our readers may be interested to see the Trinidad prices and shipments during the last three years compared as follows:—

Port of Spain (Trinidad)—*

		Total Shipt. Nuts only.	Price † Nuts.	Price ‡ Oil.	Price § Coprah.
April 3rd, 1911,	3 months	3,433,642	$29 ...	$0.91 ...	$4.30 ‖
Dec. 31st, 1910,	12 ,,	19,768,223	26 ...	1.12 ...	4.75
,, ,,	1909, ,, ,,	19,158,513	23 ...	0.80 ...	4.25
,, ,,	1908, ,, ,,	16,622,708	23 ...	0.61 ...	3.10

Ceylon, on the other hand, shipped 15,941,826 nuts in shell last year, against 20,609,864 nuts during 1908, their best year. Prices ranged from Rs. 64 to Rs. 73.50, but in isolated cases touched Rs. 75. December saw prices at Rs. 63 (per 1,000) at the mills. Those who manufactured desiccated coco-nut complained of the prices realized during the early part of the year, and though it rose later in sympathy with oil and coprah, it again fell to barely paying point. The demand also went slack, so that the mills either shut down or went slow. During 1910 26,171,159 lb. were exported, against 24,604,521 in 1909, and 26,486,222 lb. in 1908—the record year.

Mr. L. C. Brown, Inspector of Coco-nut Plantations, F.M.S., estimated that the average price for coco-nuts at that centre during the five years 1905-1909 had been a little over $30 per 1,000 ($=2s. 4d.) and of coprah $8.65 a picul=133⅓ lb. One thousand nuts on the average gave 4.30 piculs, in which case $30 of nuts collected (1,000 nuts) returned about, when turned into coprah, $37.20, including the cost of extracting and drying the kernels. By the way, Mr. Brown states that, when making coprah, a better return is obtained if the nuts are stored for a month or so before being opened, and it lessens the cost of manufacture, as the kernel is then more easily extracted from the shell. We always suggest putting the nuts in sun to dry off a little, as that has the desired result of shrinking the kernel, so that, when the shell is broken, it is easily detached; meanwhile it all helps in the drying. The question of the best kind of dryer, when mechanical process is desired, is still far from settled, though all condemn sun-drying, if only because the coprah tends to get dirty, whilst drying over the grill is still worse. We still maintain, and, as already pointed out in previous numbers, experiments in the Philippines support our ideas, that the rotary dryer is decidedly the best means, as the heat can be adjusted to a nicety, and packed away in the cylinders there is no chance, except through carelessness, of the coprah getting dirty. If needed for edible butter, the meat cannot be kept too clean. One of the leading engineers was explaining to us only last month how they were arranging the cylinders for a dryer, in answer to an inquiry from the Philippines.

The other day we approached some very large buyers of coprah and coco-nuts, who we knew grew and prepared a large portion of their requirements overseas and put the following questions to them, which they very kindly answered, in reference to the pros and cons

* Previous articles on coco-nuts and coprah are in issues of February, 1911; February, August, 1910; January, February, March, October, December, 1909; April, May, 1908; August, September, 1907.

* *ex* Messrs. Gordon Grant and Co.'s circular.

† Per 1,000 nuts, "standard selected," peeled, and in bags of 100.

‡ Per gallon, cask included.

§ Per 100 lb.

‖ It will be noted that local prices for the various products do not move in unison. On April 3rd, 1911, at the prices mentioned, preference was naturally given to selling the nuts in shell, when up to type.

of mechanical dryers and of a rotary dryer in particular:—

Question.—Do you, on the whole, prefer sun-dried or mechanically-dried coprah, if equally free from mould?

Answer.—Providing the percentage of oil in the coprah is equal, we prefer mechanically-dried coprah, but believe, as a rule, mechanically-dried coprah contains a less percentage of oil than sun-dried.*

Question.—Do you find that sun-dried coprah tends, on the whole, to arrive mouldy and dirty at the works?

Answer.—Sun-dried coprah has a tendency to arrive mouldy and dirty at the works. This may be accounted for by the fact that fermentation can take place during the slow process of sun-drying.

Question.—Do you agree that the figures in attached reprint give a correct idea of the time required for drying by the various processes named, viz.:—

Method.	Time.
Sun	5 days
Grill (over bamboos) ...	... 10 to 12 hours
Hot-air chamber	... 3½ ,, 4 ,,
Rotary hot-air process ...	... 2 ,, 3 ,,

Answer.—We agree that the figures quoted in the reprint of the time required for drying are quite possible figures, but there are many circumstances, such as country, climate, temperature, and system of mechanical drying which would affect results.

At the beginning of May prices for coco-nut products in London ruled as follows (from "Public Ledger," &c.):—

Coir Goods (per ton).

	£ s.	£ s.	£ s.	£ s.
Fibre—				
Cochin, fair to fine	17 0	23 0	17 0	23 0
Ordinary to middling ...	8 0	15 0	8 0	15 0
Ceylon	8 0	12 10	5 5	9 0
Bristle, Ceylon	13 10	26 0	11 0	26 0
Rope	11 10	18 0	14 15	18 0
Yarn, Cochin, superior... ...	25 0	29 0	25 0	29 0
Good to fine weaving... ...	21 0	25 0	20 0	25 0
Medium to good medium ...	12 10	19 0	10 0	19 0
Low and ordinary, coarse ...	9 0	15 15	9 0	15 15
Mat and roping	8 10	14 0	8 10	14 0
Ceylon, fine and superior ...	23 0	28 0	23 0	28 0
Ordinary to good	14 0	22 0	12 0	22 0

Coco-nut oil steady. Ceylon spot £36, April-June £33 10s. c.i.f., May-July £33 10s. ci.f. Cochin spot £40, April-June £35 c.i.f., August-September £34 15s. c.i.f.

Messrs. Fairclough, Dodd and Jones report that the coco-nut oil market after being quiet for some time shows signs of firming up. Ceylon: Early arrival in good demand, up to £34 to £34 5s. being forthcoming c.i.f., April-June £33, May-July £33. Landed oil is £36 ex wharf. Cochin: April-June £34 10s. to £34 15s., August-September £34 5s. Spot is £38 to £40, according to package.

Coprah steady. Manila April-June £20 15s. value Marseilles. Cebu April-June £21 7s. 6d. buyers. Java May-July £22 sellers Northern ports net. South Sea Islands April-May sellers at £21 7s. 6d. Continent and £21 5s. London. Malabar April-May £23 17s. 6d. value and Ceylon £23 value Northern ports. F.M. Straits April-May £21 15s. buyers Northern ports and F.M. ditto £21s. 2s. 6d. buyers Marseilles, all c.f. and i., delivered weight.

Against these compare the following:—

Soya oil is not much inquired for, but the value is maintained at 31s. per cwt., for Liverpool makes, in export barrels.

Soya oil beans steady. Harbin spot Hull £7 5s., April-May £7 6s. 3d.

Soya oil quiet. London: Barrels spot £30, April £30, May-August £30. Hull spot £28, May-August £28 5s. Oriental (in cases), afloat £27 15s., February-March £27 10s., March-April £27 10s., April-May £27, May-June £26 15s. c.i.f., June-July £26 15s. c.i.f.

Mr. Hamel Smith, senr., was awarded five medals as above (two gold, one silver, and two bronze) by the Society of Arts and Sciences, Trinidad (W.I.) in 1876, when he had charge of the Nariva Cocal out in that island. All the medals were the same size, and measure 2½ in. across. The gold medal (in the possession of our Editor) weighs 5¾ oz.

In a lecture delivered to a Missionary Industrial Conference at Kodaikanal, Sir F. A. Nicholson* told his audience of an experiment he made that could well be carried out on many estates, as by so doing much room would be made use of that at present is wasted, whilst possibly the crops would benefit from the protection of the palms as windbreaks, &c., and it is well known that coco-nuts when so planted yield profusely, on account of the room the leaves have on two sides, if not all round. Seven miles of coco-nuts, planting even 30 or 40 ft. apart, means 1,232 or 924 trees, which, at only 50 nuts a tree (a fair yield on an estate planted 30 by 30, and when planted singly a higher yield could reasonably be expected) would mean from 45,000 to 60,000 nuts a year. The lecturer explained that he started planting with coco-nuts a road that had been left shadeless for generations. The ryots derided the idea until the first half mile was planted, then they begged to be allowed to continue the work if they might take the profits. The planting was carried on for seven miles, and now yields a revenue that pays for the upkeep of twenty miles of road, besides benefiting both man and beast using the road, as well as protecting possibly the palms, and yielding a large crop, in this case used for local consumption.

* When this is so, we should say that it was the fault of the men behind the machine, not the machine itself, and is due to too rapid drying. Watch the sun on either cacao or coprah, and see how it works. It makes it "sweat out" its moisture, and at the same time the more it does so, the more oily does the product seem to come, up to a certain point, as if the sun would draw out the oil also. Even the sun can become too hot, and so in midday it is best with cacao, especially at the start, to shade the produce. On the other hand, the process can be too slow, and hence cause with coprah, as stated in Answer No. 2, fermentation to take place during the drying process.

* *Indian Agriculturist*, October, 1910.

Cotton.

The following were the prices for Cotton in London on May 4th, according to Messrs. Slann and Davies :—

	Good Fair.	Good.	Fine.	Superfine.	Compare Good 1910.	Compare Good 1909.	
	d. d.	d. d.	d. d.	d.	d. d.	d. d.	
Surat kinds* ...	$6\frac{7}{8}$ to 7	$6\frac{1}{8}$ to $7\frac{5}{16}$	$7\frac{3}{8}$ to $7\frac{5}{8}$	—	$6\frac{1}{8}$ to $7\frac{1}{16}$	$4\frac{15}{16}$ to 5	per lb.
Madras	$7\frac{1}{8}$ to $7\frac{1}{4}$	7 to $7\frac{1}{2}$	—	—	6 to 7	$4\frac{3}{8}$ to $5\frac{1}{4}$	—
Bengal	—	$6\frac{7}{16}$	$6\frac{11}{16}$	$6\frac{13}{16}$	$5\frac{7}{16}$	$4\frac{1}{4}$	—
Assam	—	$6\frac{5}{8}$	$7\frac{1}{4}$	$7\frac{3}{4}$	6	$4\frac{1}{2}$	—
China	—	$6\frac{1}{2}$	$6\frac{7}{8}$	$7\frac{1}{4}$	$6\frac{3}{8}$	5	—
West Indian ...	$8\frac{1}{2}$	9	$9\frac{1}{2}$	$9\frac{3}{4}$	$8\frac{1}{2}$	$5\frac{1}{4}$	—
Sea Island ...	12	14	17	20	17	9	—
West African ...	$7\frac{1}{2}$	$8\frac{1}{8}$	$8\frac{3}{8}$	—	$7\frac{3}{4}$	—	—
East ,, ...	8	$8\frac{13}{16}$	$10\frac{3}{4}$	—	$8\frac{3}{4}$	—	—

* Liverpool quotations.

Cotton has been much less active during the past week (ending May 4th), although towards the end of it there appeared to be an improvement in the Spot demand. The quotation for "Middling" has been reduced from 8·30d. to 8·28d. The "Future" market has been nervous, near positions have held their own, but New Crops have been distinctly weaker, and have fallen about 9 points. The weather accounts from the South are more reassuring, and seem to suggest that the Crop is having a favourable start. East Indian is moving quietly, but at steady rates.

The import into Liverpool this week amounted to 15,844 bales, since September 1st 3,870,530, same week last year 62,522, last year's total 2,606,839 bales. The estimated Sales amounted to 55,000 bales, including "called." Middling American is quoted at 8·28d. per lb., last year 7·96d., 1909, 5·58d.

Movement of American Cotton since September 1st :—

	1910-11.	1909-10.	1908-09.
Brought into sight	11,040,000	9,569,000	12,503,000
Exports from United States since September 1st—			
To Great Britain	3,102,000	2,023,000	3,149,000
To Continent, &c.	3,601,000	3,155,000	4,086,000
Total crop	—	—	13,825,000

The latest quotations of Americans for delivery, basis middling, any port, G.O.C. :—

	May 4th.	Last Week.	Last Year.
	d.	d.	d.
May	7·94½	7·91½	7·71½
May—June	7·90	7·88	7·67
June—July	7·82	7·81	7·63

Coffee

By Messrs. C. M. and C. Woodhouse.

During the week ending May 6th the demand for all descriptions was slow and prices ruled in buyers' favour. At the close, however, there was some improvement, and the sales at the beginning of May passed off with a steady tone. The stocks in the principal ports of Europe on May 1st, according to Messrs. Düüring and Zoon, show an increase for the month of 62,000 bags against a decrease of 262,000 bags last year; the visible supplies on the same date show a decrease of 305,000 bags against a decrease of 401,000 bags in 1910. The market for "futures" has been generally firm on higher New York and Continental advices, and though there has been some fluctuation on larger crop estimates, the latest price of September Santos shows an advance of 1s. 4½d. for the week. We quote :—

		To-day.	April 27th, 1911.
London ..	Santos, Sept. delivery	48s. 0d.	46s. 7½d.
New York ..	No. 7 Rio ,, ,,	10·28 cents.	10·09 cents.
Hamburg ..	Santos ,, ,,	52¾ pf.	51¼ pf.
Havre ..	Santos ,, ,,	65 francs	63½ francs.

The receipts at Rio and Santos from July 1st, 1910, to May 3rd, 1911, were 10,021,000 bags, against 14,303,000 bags and 11,666,000 bags in the two previous seasons respectively.

Sales include the following, viz. :—

East India.—Mysore, 62s. to 64s. for smalls, 63s. to 76s. 6d. for low middling to fine middling, 66s. to 73s. 6d. for middling to good middling bold, 82s. 6d. to 91s. 6d. for fine bold; Coorg, 61s. 6d. to 63s. 6d. for smalls, 62s. 6d. to 67s. for low middling to good middling, 64s. to 76s. for low middling to fine bold; Neilgherry, &c., 62s. to 64s. for smalls, 64s. to 70s. for low middling to good middling, 66s. 6d. to 79s. for low middling to good bold; Travancore, 61s. 6d. to 62s. 6d. for smalls, 63s. 6d. for medium, 66s. for bold; Naidoobatum, 64s. for smalls, 64s. 6d. to 75s. for low middling to good middling, 68s. to 80s. for low middling to good bold.

Jamaica at 58s. 6d. to 61s. 6d. for smalls, 60s. to 63s. 6d. for ordinary to fine fine ordinary.

Demerara at 60s. for bold yellowish Liberian.

Sumatra at 61s. to 64s. for medium to bold Liberian.

Mombasa at 63s. 6d. to 64s. for smalls, 64s. 6d. to 65s. 6d. for medium.

Nyasaland at 62s. for bold.

Costa Rica at 62s. 6d. to 66s. for smalls, 60s. to 65s. for ordinary to fine ordinary, 66s. to 70s. 6d. for fine fine ordinary to good middling, 67s. to 76s. for middling to fine bold.

Guatemala at 62s. 6d. for smalls, 58s. 6d. to 64s. for ordinary to fine ordinary, 63s. to 66s. for bold.

Salvador at 60s. 6d. to 64s. for ordinary to fine fine ordinary, 65s. to 65s. 6d. for bold.

Nicaragua at 62s. for foxy greenish, 62s. 6d. for

smalls, 62s. 6d. to 66s. 6d. for fine ordinary to middling, 64s. 6d. to 74s. 6d. for middling to fine bold.

Vera Paz at 61s. to 63s. 6d. for smalls, 63s. to 68s. for fine ordinary to middling, 68s. 6d. to 80s. for middling to good bold.

Mexican at 63s. for smalls, 66s. for middling.

Colombian, &c., at 63s. for smalls, 61s. to 65s. 6d. for good ordinary to low middling, 63s. to 67s. for bold.

The India-rubber Market.

By Messrs. S. Figgis and Co.

After a rapid decline and sales of hard fine down to 4s. 9d., the market just before the last sales in April closed better with more trade inquiry. Sales included: Hard fine Pará, near delivery 5s. 3d., distant 5s. 4d.; soft fine Pará, value 5s. 1d.; Negroheads, scrappy Manaos, small sales up to 3s. 11d.; Cametas about 3s. 3d.; Island about 3s.; ball, Caucho, up-river, f.a.q., sold down to 3s. 9d. and up to 4s., closing firm at 4s. 1d.; Tocantin, forward delivery sold at 3s. 7½d., and now worth 3s. 9d.

At the auctions this week 500 tons Eastern Plantation kinds were offered and mostly sold. At the commencement of the sales prices showed over 1s. per lb. decline, but as they proceeded prices improved 4d. to 6d. per lb. Finally a considerable business in Plantation for forward delivery was done at about 6d. over the lowest prices realized during the previous week.

During the next week, ending May 6th, after a fair trade the market closed flat at 3d. decline for the week, with sales of fine hard, closing May-June 5s. 1d., forward 1d. to 2d. more; fine soft, about 4s. 11d.; Negrohead flat, scrappy Manaos about 3s. 11d.; Cametas, 3s. 2d.; Island, 3s., no sales reported; ball, Caucho, after business up to 4s. 2d. for up-river, f.a.q., closes dull at 3s. 11½d.

Pará rubber statistics for the month of April (tons):—

	Pará.	Caucho.	1911.		1910.	1909.	1908.
Receipts at Pará ..	2,360	1,130	= 3,490	agst	3,600	3,760	3,100
Shipments to Europe	1,120	600	= 1,720	,,	3,660	2,340	2,000
,, America	830	280	= 1,110	,,	470	1,910	1,050

Crop statistics, June 30th, 1910, to April 30th, 1911 (ten months):—

		Pará.	Caucho.	1910-11.	1909-10.	1908-09.	1907-08.
Pará Receipts	1910-11	27,010	5,710	32,720	35,780	34,180	31,780
	1909-10	29,230	6,550				
,, Shipts., Europe		12,980	3,890	16,870	19,250	16,700	19,110
,, ,, America		10,360	1,280	11,640	15,770	16,970	11,610

Rubber Share Market.

Writing on April 27th *re* the Brazilian rubber situation, Messrs. Zorn and Leigh-Hunt said: With manufacturers refraining from bidding, and with the Brazilian Syndicate apparently unwilling to add further to their already bulky stock of rubber, the material market has been very depressed, hard fine Pará touching 4s. 8d. per lb. At the moment of writing, the market is better, 5s. 1d. per lb. being bid for Pará. It is stated with more or less assurance that the Syndicate above referred to intend to purchase, if necessary, up to 8,000 tons of rubber, which is to be sold at not under 8s. per lb. It is obviously a matter of conjecture as to whether this group will be sufficiently powerful to again lift the price of Pará to this level, as the bear party, consisting of very influential dealers, are undoubtedly using every effort to break the bull position, and very likely are in close touch with manufacturers themselves.

The outlook, then, is one of uncertainty; but this consumers' hand-to-mouth policy of buying only for immediate needs is becoming dangerous, and must be very hampering and nerve-racking, as in previous years it was the unquestioned policy to hold a fair margin of stock for future demands. These demands are going to be big. The motor industry is swallowing rubber with enormous rapidity, and its appetite grows with eating.

The holidays at the beginning of May, in conjunction with a large measure of uncertainty as to the course of the material market, has brought business in rubber shares to a comparatively low ebb. Meanwhile, the tide of prosperity in the rubber industry flows steadily on; proof of this being clearly shown by the large number of excellent reports now coming to hand. It is the nature of these reports—demonstrating as they do the big dividend-earning capacity of well-placed, well-managed estates—that makes one feel that the rubber industry is not a "fairy's whim," but a sensible, solid, business-like undertaking of lasting merit. Reading the annual reports now appearing day by day, it is very noticeable how many of the comparatively young companies are entering the ranks of the dividend payers for the first time, with the prospect of largely increased distributions at this time next year.

Most quotations are a little lower than those ruling a week ago, though rubber itself is a trifle higher.

Anglo-Malays are offered at 20s. 10½d., and Bandjarsaries can be bought at 1⅞. Batu Caves keep steady at 15. Batu Tigas are rather better at 4⅜, and Briehs are a shade harder at 1½. Bukit Mertajams have been placed at 3s. Ceylon Timbers are offering at 4s. 6d. at the moment, but Chersonese hold their own at 4s. Cicelys have shed 1-16 at 2, but Consolidated Malays are very firm at 21s. Highlands are unchanged on balance just under 5. Kepitigallas are the turn lower at 17s. Kuala Lumpurs look rather sellers at 7⅜, but Lanadrons are stronger at 4 9-16. A few Lankat Rubbers can be purchased at 2, and Ledburys at around 1¾ premium. Linggis are offering at 47s. 9d. ex rights. Malaccas, on good French buying, have come to 9¾. Mid-Easts have been bought by a knowing group, and are better at 5-16 discount. Patalings have weakened to 2⅝, but Pelepahs keep very hard at 4s. 6d. bid. Peraks are just 7s. 9d., and Rubber Estates of Johore are 1½. Rubber Plantations Trusts are steady at ⅞. Sapongs have eased to 1½, and Seafields are obtainable at 5⅝ ex div. Selangors are not better than 2¾, and Seletars changed hands at 14s. 3d. Semphas have a better appearance, shares being placed at just under par. Serembans could be sold at 4⅛. Shelfords continue firm at 3¼. Singapore Uniteds have been largely bought at 7½d. premium, and Straits (Bertam) have improved to 7s. Sungei Salaks are quiet at 4s.; a first dividend of 10 per cent. has just been announced by this company. Tanjong Malims have weakened to 3-16 premium. Tremelbyes are lower at 5¼, as are United Serdangs at 5⅛. Vallambrosas are buyers at 33s. 3d.

Tea.

By Messrs. Wm. Jas. and Hy. Thompson.

At the auctions this week ending May 6th, the strong tone noticed in our last circular has been fully maintained, and for all grades up to about 9d. per lb. demand has been active with strong bidding, especially among useful teas between 8½d. and 9d. per lb. The amount of tea remaining to be sold in merchants' hands is now of such compass as to suggest that by the end of the month the balance of the crop will have practically been sold, so that in the event of an early season, which was hinted at in some quarters, the new teas should be favourably received.

The quantity on offer amounted to 33,404 packages, some 11,000 packages heavier than last week, comparing with 22,207 packages then and 29,114 packages at the corresponding sale last year. The total amount offered since July 1st (including new season's tea previously sold) is 1,482,909 packages, against 1,517,245 packages during the same period 1909-1910. The demand for Indian tea was good from most quarters, and a strong tone was experienced for all grades up to 9d. per lb., useful teas between 8¼d. and 9d. per lb. showing in some cases improvement. Common kinds were firm, and except where very rough and stalky in leaf, well maintained quotations, only a limited quantity of sound leaf selling at 7¾d. per lb. Medium kinds were well supported, and the few invoices on offer of a stand-out character realized good prices, brokens alone being inclined in some cases to irregularity. Travancore and Southern Indian teas sold freely at fully last prices. The highest averages obtained were: *Darjeeling*—Ring Tong, 11¼d. *Assam*—Samdang, 11¼d.; Dhoedaam, 11d., and Deohall, 10¾d. For the whole sale on estate account the result was 8½d. per lb., against 8d. per lb. a year ago.

With Ceylons for practically all leaf teas and for Brokens up to 8¾d. and 9d., bidding was strong and general; but over about 9d., brokens occasionally failed to come up to valuation. A considerable number of higher grown teas are showing further falling off in quality, and to some extent this is responsible for the rather easier appearance of good brokens. The chief feature of the sale was the keen competition for medium to good Pekoes and Orange Pekoes, which frequently showed advances on late rates. In several invoices the Pekoes brought more money than the brokens. Dusts and Fannings again received good support.

The most noteworthy averages were: Goatfell, 11¼d.; Cranley, 11d.; Mount Vernon, 10¾d.; Henfold, Udaradella, Caledonia, 10½d.

The average of the whole sale on estate account was 8⅞d. per lb., compared with 8½d. per lb. last year.

A fair business is reported privately in Chinas at about last quotations, the lower grades of black leaf being in most demand.

A steady tone for all grades of Javas was apparent, although little actual alteration in quotations was to be noted. The best averages made were: Tanawatte, 10d.; Goenoeng Kantjana, 9d. For the whole sale on garden account the average was 8⅜d. per lb., against 7¾d. per lb. last year.

Sugar.

According to Mr. C. Czarnikow, the destruction by fire of the Arbuckle Refinery in New York, with the possibility of re-sales of raw sugar, did not improve the tendency of the American market, where prices declined from 3.92 to 3.80 cents, and where the meltings are now only 48,000 tons; then Willett sent cables valuing the Cuban crop at 1,600,000 tons, whilst a prominent exporter states it at maximum 1,460,000 tons, but the weekly receipts are still high at 60,000 tons, and if the April receipts (by the weekly figures about 265,000 tons) should be corrected to about 290,000 tons, then only 300,000 against 320,000 tons in 1909 would remain to be made in order to reach a similar crop of 1,514,000 tons. In addition to this news, we had splendid beet weather, because rain showers supplied the wished-for moisture, and it is said that sowings will show a larger excess than Licht's figures printed on May 6th. Exaggerated rumours of Javas sold or pressing for sale were also circulated, therefore consumers bought very sparingly indeed, and the May liquidation (though tenders were only 10,000 to 15,000 tons) thus began under adverse circumstances, prices moving from 10s. 6¼d. to 10s. 2¼d., but recovering to 10s. 4d. on the news that the Budget would be presented on the 16th inst., when more demand is expected. May closes at 10s. 2¾d. however, and it is somewhat surprising that August is quoted only 1½d. more, as this does not pay for holding the sugar over. Actual sugar is not pressing, and seems kept back, but the premium over next crop is reduced to 9d., which is a step in the right direction, as we shall have some sugar available even for American wants (should they really require any), provided Russia sells.

The American market has again been easier, with less business passing. The spot quotation is 3.80 cents=11s. 3d. c.i.f. for 96 per cent. Cubas= 9s. 9d. c.i.f. for 96 per cent. Javas=8s. 9d. f.o.b. Hamburg for 88 per cent. nett Beet.

In the United Kingdom business in cane sugar has been upon a moderate scale, and the value of 96 per cent. refining sugars is about 3d. per cwt. easier. For grocery crystallized a decline of 3d. to 6d. per cwt. was accepted. Low sugars continue scarce at unchanged values.

From cane-producing countries there is nothing fresh to report.

With British West India the total transactions for the week amounted to about 5,000 bags. Crystallized Demerara, middling yellow 15s. duty paid; syrups, middling greyish 12s. Crystallized Trinidad, good middling yellow to good pale 15s. 6d. to 16s.

In Liverpool, about 6,000 bags Mexicans sold at 11s. 7½d. to 12s. 3d. quay tel quel; about 6,511 bags Brazils at 8s. 8¾d. to 9s. quay and store; 3,425 bags Peruvians, syrups at 9s. 9d. to 10s. 3d., grainy at 12s. to 12s. 0¾d. quay.

We hear that of coco-nut products, the Seychelles last year shipped 2,660 tons coprah (valued at Rs. 862,857, or £57,000), and 350 hhds. oil (worth Rs. 17,623, or £1,180). The Vanilla crop was still low (26 tons), and the present one seems no better, if as good.

The London Cocoa Market.

By The Editor.

Looking back across the last two months of the cocoa market, one is bound to realize that the level of values has been steadily settling down, and though the market at no time has shown any excitement or anxiety at the large stocks in London and Havre, everyone knows that they are there, so buyers naturally move with extreme caution, and sellers where lucky enough to be among the chosen ones have wisely met buyers, so that sales have resulted. Grenadas especially have been favoured and continue to sell well, manufacturers being apparently glad to secure them. Bahias are still resting in the background, bids for even the pick of "superior" marks being rather low compared to what is being willingly paid for Grenadas. Rather more Guayaquils have been selling, the last sale of Caraquez showing a drop of 2s., but the Easter holidays and continued large receipts render business difficult. To the end of April the receipts at the Pacific port amounted to 250,800 qtls., against 160,400 qtls. last year, and 240,300 qtls. in 1909. It will be interesting to see how this year will work out, because although in the above figures 1909 also seems far ahead, and is almost up to this year, that year finally ended with only 620,000 qtls., against 758,400 qtls. in 1910. The same as 1909 fell away therefore (it started doing so after August), so may the record receipts now coming forward. At the lower level of values Trinidads have been selling more freely, the home manufacturers being among the principal buyers. Although individual estates in Grenadas have done better with their crops than last year, the total output still lags behind the record crop of 1909-10, and seems now unlikely to catch them up. The exports from October 1st to April 17th were 48,830 bags, against 55,050 bags in 1909-10, and 52,323 bags in 1908-9. Fine Ceylons have been doing well, realizing up to 84s. 6d., but medium qualities followed the market and have been selling 1s. to 2s. lower than last month. Coming to the matter of supplies the joint stocks of London and Havre, taking the latest figures, are almost appalling, the combined stocks at London, Liverpool, and Havre working out as follows:—

	1911. Bags.	1910. Bags.	1909. Bags.
London, April 29th ...	130,100	102,178	114,655
Liverpool, ,, ...	13,930	10,680	5,887
Havre ,, ...	288,116	233,828	175,720
Comparative totals	432,146	346,686	296,262

The Board of Trade figures for April show a falling off of 703 tons of cocoa in the deliveries for home consumption during last month (1,133 tons against 1,836 tons in April, 1910). It is suggested that the cocoa manufacturers have only been taking their immediate requirements out of bond in hopes that the Budget would have removed the duty off cocoa altogether, but in this they were disappointed, some modification of the import and export duties on the manufactured article being the only change introduced. From a revenue-producing point of view, the tax is not worth retaining, but for all that I doubt if we shall see its removal. In the March report (p. 59), I drew attention to the strenuous efforts then being made by some 200 M.P.'s to get the duty removed. Meanwhile, anticipation of the tax being removed is put forward as the reason of our low deliveries for home consumption throughout the United Kingdom, and the high stock in London.

The actual Board of Trade figures work out as follows:—

Raw cocoa only—	Landed.	Del'd. H.C.	Export.	Stock (April 30th)
Jan.—April, 1909—	16,992	9,351	2,193	10,529 tons
,, ,, 1910—	12,974	7,888	2,666	11,240 ,,
,, ,, 1911—	15,739	6,500	1,985	17,020 ,,
	Incr. 2,765	Decr. 1388	Decr. 681	Incr. 5,780 ,,

According to Mon. Anthime Alleaume, the Havre stock at the end of February was:—

Havre Stock, April 20th.—	1911. Bags.	Value Fcs.	1910. Bags.	Value Fcs.
Pará	16,434	67·50 to 72·50	15,854	67·50 to 72
Bahia	35,786	61 ,, 68	22,200	61 ,, 68
Venezuela ...	41,142	68 ,, 175	44,449	67 ,, 150
Trinidad ...	49,499	67 ,, 70	40,470	69 ,, 72
Grenada and other W.I. ...	6,530	61 ,, 68	7,357	60 ,, 68·50
San Thomé ...	29,345	65 ,, 66·50	17,318	65 ,, 67·50
San Domingo ...	5,272	61 ,, 64	12,500	57·50 ,, 61
Haiti	16,485	52 ,, 65	19,849	50 ,, 64
Accra	46,852	59 ,, 61	19,586	58 ,, 60
Guayaquil ...	14,770	69 ,, 80	6,944	76 ,, 85
Others	26,001		27,292	
Total ...	288,116		233,819	

The London stock has also increased over 10,000 bags since my last report, standing on April 29th at 130,100 bags, and on May 6th, as under, only six bags less, say:—

London Stock, May 6th—	1911. Bags.	1910. Bags.
Trinidads	5,676	8,980
Grenadas	19,843	17,388
Other W.I.	6,543	5,197
British West Africa ..	7,839	6,768
Portuguese W. Africa ..	5,950	1,079
German West Africa ..	7,751	1,917
Ceylon and Java	22,366	29,234
Guayaquil	40,839	16,766
Brazil and Bahia	1,438	1,375
Other Foreign	11,858	10,765
Totals ..	130,094	99,467

According to the *West India Committee Circular*, the Gold Coast exported 24,043,375 lb. (over 1,000 tons) in January-February, against only 14,660,000 lb. last year. No wonder, therefore, that there are large stocks everywhere. So large a quantity being shipped in so short a space of time shows, I take it, a marked improvement in the transport facilities of the Colony. It will be remembered that in the twelve months of 1908, only 28,500,000 lb. were shipped, and 21,000,000 lb. in 1907. We can well claim that the Colony produced 60,000,000 lb. last year, only so large a quantity could not be brought down to the coast in time. For January-March, Bahia actually exported 148,338 bags, against 104,583 bags last year. The receipts of San Thomé at Lisbon were 173,728 bags for January-April, against 221,088 bags last year. Coming to sales, the latest transactions leave values at about the following:—

Trinidad.—Middling red, 55s.; good to fine marks, 56s. to 58s.

Grenadas.—Fine is not worth more than 54s. now; good red, 53s.; common unfermented to good fair fermented, 49s. to 52s.

Dominica.—Fine sold at the end of April up to 53s.; common down to 45s.

Jamaica.—The best marks sold up to 53s. 6d.; good red marks, 52s.; fair, 50s.

St. Lucia.—Good red sold up to 52s.; common unfermented, 49s.

Costa Rica.—Good red realized 52s.

Guayaquil.—None are reported as having been sold for some time. Values are nominally quoted at 55s. for Caraquez, and up to 63s. for Arriba.

Ceylons.—Fine bold have been selling well, but the commoner graders are lower. The last business included good fair medium up to 61s., and fair at 59s.; fine sold at 77s. to 81s.; and good bold, 64s. to 70s.

In our next issue we shall call attention to the new edition, just out, of "The A.B.C. to Rubber Planting Companies in Malaya, Sumatra, and British North Borneo, together with their Possible Production, Profits and Dividends for Seven Years," by Messrs. M. S. Parry and E. M. Muraour. Price, 2s. 6d. London: F. C. Mathieson and Sons, 16, Copthall Avenue, E.C., or Tropical Life Publishing Department.

Messrs. Francis Shaw and Co., Ltd., Bradford, Manchester, and 139, Cannon Street, London, E.C., have issued an attractive catalogue (No. 22) of their rubber machinery and estate appliances, which will be much sought after and appreciated by the directors and secretaries of the rubber companies on this side, and of the owners and managers overseas. Illustrated with some especially fine blocks, intending buyers can see at a glance the perfect finish of the machines, and the improvements introduced since the last list was issued. This is the case with all sections, viz., washing, crêping, and sheeting machines, coagulators, vacuum dryers, blocking presses, or the complete buildings, and ready-to-start factories, as shipped by the firm. Buyers of estate appliances will find the catalogue very useful to have by them for reference.

We see that Professor Sir Rubert Boyce has issued a third volume, setting forth the results of his further researches into the doings of his old friend, the Stegomyia, and further explains how in West Africa much good can be done by keeping the ground free from puddles, swamps, stagnant drains, and disused receptacles capable of holding water. As with his first two books, "Mosquito or Man?" and "Health in the West Indies," Sir Rubert's views are worthy of careful consideration by everyone interested in the Tropics, particularly those centres which are not so healthy as they might be. This, his latest book, entitled "Yellow Fever and its Prevention," costs 10s. 6d., the same as its predecessors, and has also been published by Mr. John Murray, of Albemarle Street, London, W. We shall review the book fully in our next issue.

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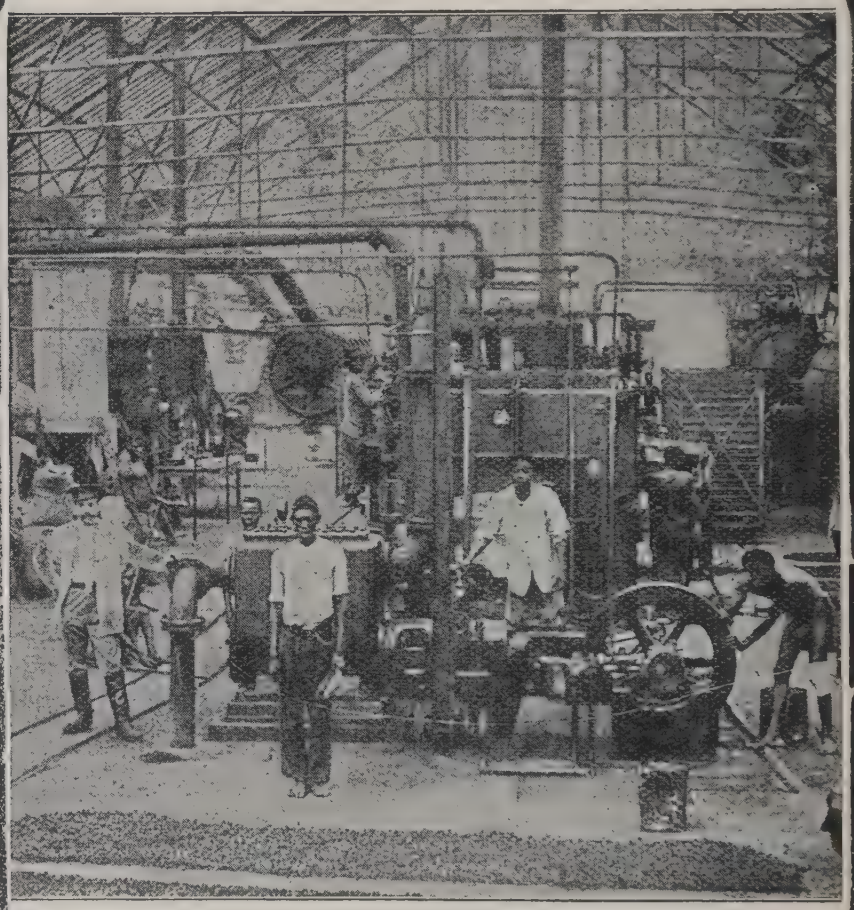

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Books for Rubber Planters.

WE have to thank many of our contemporaries for giving our book on "Soil and Plant Sanitation," long and important notices in their columns. A few of these will be found on our advertisement page x, pressure on our space having prevented their inclusion here.

The following books "*sur le tapis*" will be found of great use if placed, when published, alongside "Soil and Plant Sanitation" on our readers' bookshelves:—

"Cacao: Its Cultivation and Curing," by the late J. Hinchley Hart, F.L.S. 307 pages, 65 illustrations; price 8s. post free. We have often called attention to the above book, whose appearance we gladly welcome, as the author had exceptional practical knowledge on the planting up and management of cacao estates, and the preparation of their crops.

"The West African Rubber Industry," by Dr. Cuthbert Christy, the well-known authority on Funtumia rubber, is also due. This important work will be profusely illustrated with some 75 pages of the best specimens of the process-block maker's art that we have yet seen, whilst the information and particulars given will also be of an exceptionally high level. The cost of the book will be 12s. 6d. post free.

"The Physiology and Diseases of *Hevea brasiliensis*," by Mr. T. Petch, B.Sc., B.A., &c., well known to our readers as Government Mycologist, Ceylon, should also be ready by now. This will run to 300 pages, with 18 plates (one coloured), and cost 8s. net, post free. As the diseases of rubber trees have not yet been fully treated by any authority, a book by a leading authority like Mr. Petch is certain to command a ready sale.

Dr. Ph. Schidrowitz, F.C.S., one of London's leading analysts, has also published a leading work on *l'or noir* of the Tropics entitled "Rubber," price 11s. 6d., post free. The work will contain illustrations and diagrams, and has been published with the object of describing in a practical and critical manner the different branches of the rubber industry. The majority of the illustrations are from drawings and photographs made by the author, when studying rubber in Malaya, Borneo, &c.

We shall be pleased to supply any of the above at prices quoted on receipt of remittance. We have noted with pleasure that our publishing department has been quite busy of late; this shows that those engaged or making a study of tropical agriculture are anxious to hear what others have to say on the particular crop in which they are interested, and so willingly buy any book on the subject provided the name of the author is one to inspire confidence.

ACCORDING to the *Liverpool Chamber of Commerce Journal*, the Panama Canal will be formally completed in January, 1915, but there is every reason to anticipate that it will be open for restricted use at least one year before. The heavy toll on the lives of the workers has been stayed—and to Liverpool citizens it must always be a source of pride, that Professor Ronald Ross, of the Liverpool School of Tropical Medicine, was sent to advise on the then apparently insurmountable barrier of disease amongst the workers.

Bahamas and Bangkok News.

Two exhibitions that deserve more than the passing notices we can afford them are the fifth annual Bahamas Agricultural Exhibition, held in Nassau (Bahamas) in March, and the second annual Agricultural and Commercial Exhibition held at Bangkok in April. Both were evidently very successful, and seem likely to continue as annual affairs. We see by the *Nassau Guardian* that at the Bahamas Exhibition His Excellency the Governor, when declaring it open, referred to the gratifying results of the work done by the Board of Agriculture, under its energetic Curator, Mr. Munro Cunningham. A large number of visitors, including many tourists, visited the exhibition and viewed the various sections, including fruit, vegetables, sisal, and other products, with much interest. "Compared with the first exhibition," reports the *Guardian*, "the present one contained exhibits of marked improvement both as to quality and quantity, supplying plenty of evidence of the satisfactory results of the work of the Board of Agriculture and Mr. Munro Cunningham, our Curator. Individual exhibits included samples of cotton from Long Island and Rock Sound, with a staple $1\frac{3}{4}$ in. long, Long Island also sending 300 lb. of native-grown tobacco. The sisal exhibited was of particular interest; alongside of fine white bales of machine-cleaned sisal were bales of the hand-cleaned product little if any inferior to the other, and we are informed that an expert who inspected the fibre stated that if all the hand-cleaned fibre exported approximated the standard of that exhibited it would mean a difference in its price in the New York market of 1d. per lb.—a most important matter for the many small producers and a very strong argument on behalf of inspection and grading."

Particulars of the Bangkok Exhibition have not yet come to hand. Mr. W. G. Weeks was in charge of the foreign section. The various sections consisted of (1) Vegetable food-stuffs generally; (2) sugars, including palm-sugar, coconut-sugar, and cane-sugar; (3) spices; (4) fibres, including silk, cotton, tree-cotton, hemp, &c.; (5) tobacco; (6) woods; (7) aromatic woods; (8) gums and resins, including red rubber, Pará rubber, gamboge, resin, pitch, &c.; and (14) agricultural and industrial machinery driven by steam, internal combustion, electric or hand power.

Talking of rubber reminds one that the cultivation of this article has recently received attention in Siam, and the future is likely to bring extended areas planted up, probably with Hevea trees, especially in the Moulbron of Puket. Several large and many small estates have been planted in the province of Trang, and in Setul also plantations are springing up. The provinces of Gerbi, Trang, and Setul are all said to be suitable for rubber,* and possibly the more northern territories of the Moulbron of Puket will prove to be the same when opened up. There is undoubtedly excellent openings for the investment of British capital in Siam, as other countries are finding out. We therefore hope that the enterprising band of Englishmen at present engaged in pushing British interests out in that part of the world will receive the necessary financial and political support from this side.

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* See Consular Report, 1909-1910.

Rubber in German East Africa.

THE MKUMBI RUBBER PLANTATIONS, LTD., AND THE MANIHOT RUBBER PLANTATIONS, LTD.

THE curiously different results from rubber planting, especially of the *Manihot glaziovii* species of Ceará rubber, in the British East African Protectorate and German East Africa are arousing great interest in the minds of British investors in rubber shares. At the most there are only four degrees of latitude between the former and the latter. Point 1° to point 3° south of the equator takes in pretty nearly the whole of the rubber-producing area of British East Africa, while the whole of the Usambara producing district is included between 3 and 5½°. In British East Africa the results, so far as they have become public property, are distinctly disappointing, while in German East Africa the results, although below the anticipations announced in prospectuses issued during the boom period, at least show very healthy indications for the future. Various reasons are given for this difference, but the concensus of opinion is that there is some subtle difference in the soil of the two districts. Our readers are probably aware that the delimitation of the two areas proceeds by an arbitrary line from the little town of Wanga, south of Mombasa, in a north-westerly direction for about 120 miles inland, and then follows natural boundaries to the northward of the Kiliman-Ndjaro district and thence onwards a distance of about 300 miles to the middle of Lake Victoria Nyansa. No doubt the different results obtained from the rubber planted north and south of this line will form a subject of much discussion in the near future.

Our present concern is to give some particulars relating to the doings of two German East African Companies, the Mkumbi Rubber Plantations, Ltd., and the Manihot Rubber Plantations, Ltd., which came into existence, the former towards the end of April last year, and the latter about a year ago. The plantations of these two companies are situated close to one another on the Usambara line of railway, about 17½ miles from the Port of Tanga, German East Africa. The Usambara Railway is being vigorously, although unostentatiously, pushed westwards, its objective being apparently the lower half of the Lake Victoria Nyansa. It has already been constructed from Tanga right up to the vicinity of Moshi, which is situated at the foot of the Kiliman-Ndjaro range of mountains.

Mkumbi Plantation Trees being Tapped at the age of 2½ years.

The Mkumbi Rubber Plantations, Ltd., possesses an area of about 890 acres, or more than one and a third square miles, which is all freehold. When the Company took over possession last year, 432 acres of this area were planted with 175,000 rubber trees (*M. glaziovii*), about two-thirds of which had reached the

tappable point. The whole of those trees are now being tapped and a further area of about 180 acres has since been cleared by the removal of the primæval forest and planted with about 80,000 trees, which will be in a tappable condition within the next eighteen or twenty-one months.

The history of the *M. glaziovii* tree in civilization, as it may be termed, that is, as a plantation tree, is only being gradually learnt. In our opinion, all the companies expected a greater yield from this tree during its first two or three years of producing life than results have warranted or will warrant. There is no doubt that the soil of German East Africa and the general climatic conditions are specially favourable to the early maturity of this tree, and to its preservation in a condition of at least comparative health. On the other hand, it is clear that if the tree is to attain a healthy maturity it must not be too heavily tapped during its third and fourth years of life as a tree, or in other words, its first and second years of producing power. Its mean power of production appears to be about $\frac{1}{4}$ lb. during the first year of tapping, and this quantity seems to require incisions on about twenty-four separate occasions. From this it is evident that there must be very considerable art in the extraction of rubber at the outset, seeing that the quantity of latex which exudes cannot be more than two to three small globules per incision on each occasion. During the second year it is assumed that the quantity per tree may be expected to reach about $\frac{3}{8}$ lb. per annum. After that the result is hypothetical, but by the fourth year it may also be assumed that its power will run to $\frac{3}{4}$ lb. of dry rubber per tree per annum.

On the whole the *M. glaziovii* tree has proved to be very free from pests. The one most to be feared is the white ant, and the hunt for this little creature, which multiplies with terrific fecundity, is a distinct source of expense to most companies. The ant must be searched for by digging deep holes, and the sharp ear of the natives, accustomed to the mysterious messages of Nature, discovers the abode of her majesty by a peculiar humming sound. The raid which follows destroys millions of these destructive insects, and the work of destruction, if followed systematically and persistently, no doubt minimizes, if it does not actually eradicate this pest.

The Natives bringing in their Rubber to be Weighed.

The Mkumbi Company is reported to have actually produced about 32,000 lb. of dry rubber since its inception as a company. Up to now that rubber has been sold in an uncleaned condition, and because of the great fall in the price of rubber, has only realized relatively low prices.

During the last month, however, a factory, which is the joint property of the Mkumbi Rubber Plantations, Ltd., and the Manihot Rubber Plantations, Ltd., has been erected in the Port of Tanga with a complete rubber-cleansing plant, manufactured by our old friends, Messrs. David Bridge & Co., Ltd., of Castle-

ton, near Manchester. That factory is now cleansing the rubber of both companies, and almost by the time this article appears the rubber will be marketed in a cleansed and crêped condition, and therefore command a much higher price at the auction sales.

We understand that the Mkumbi Company is proceeding with the clearing of the balance of its land, which may all be expected within a comparatively short time to be planted with rubber trees, and therefore the objective of the Company will be the possession of about 320,000 trees.

At the outset the trees were planted at distances of 3 by 3 metres, or round about 10 ft. apart. As the foliage of these trees is dense, the new planting is also of gaining revenue in the early months of the new plantings. The results of these smother-crops will be anticipated with considerable interest.

Hitherto the rainfall, which is round about an average of 60 in. per year, seems to have sufficed for the health of the *M. glaziovii* tree. It may be, however, that in the near future the question of the necessity for irrigation may arise, and the Company has already found that water is reached at shallow depths in the sinking of wells.

Our illustration on page 103 shows trees of these plantations which, at the age of two and a half years, were being tapped. The size and development of the trees at such an early age is very remarkable, as will

Manihot Company's Young Trees in Wide Planting.

being made at the rate of 4 by 4 metres, or about 13 ft. apart, and it is expected that the trees will more quickly mature and therefore become valuable assets at an earlier date than with the closer planting.

It remains to be seen whether it is wise to allow the *M. glaziovii* tree to run so much to leaf, as it seems to do in its German East African home. It may be that it would be wise to prune the branches considerably and so keep the strength in the trunk of the tree, provided that this does not cause an undue amount of tubers to form underground to switch off the strength of the tree from the crown to the foot. The Company has adopted various forms of smother-crops after the clearing of the virgin land, with a view partly to clearing the land of weeds and readily be gathered by comparing them with the bodies of the men close to them.

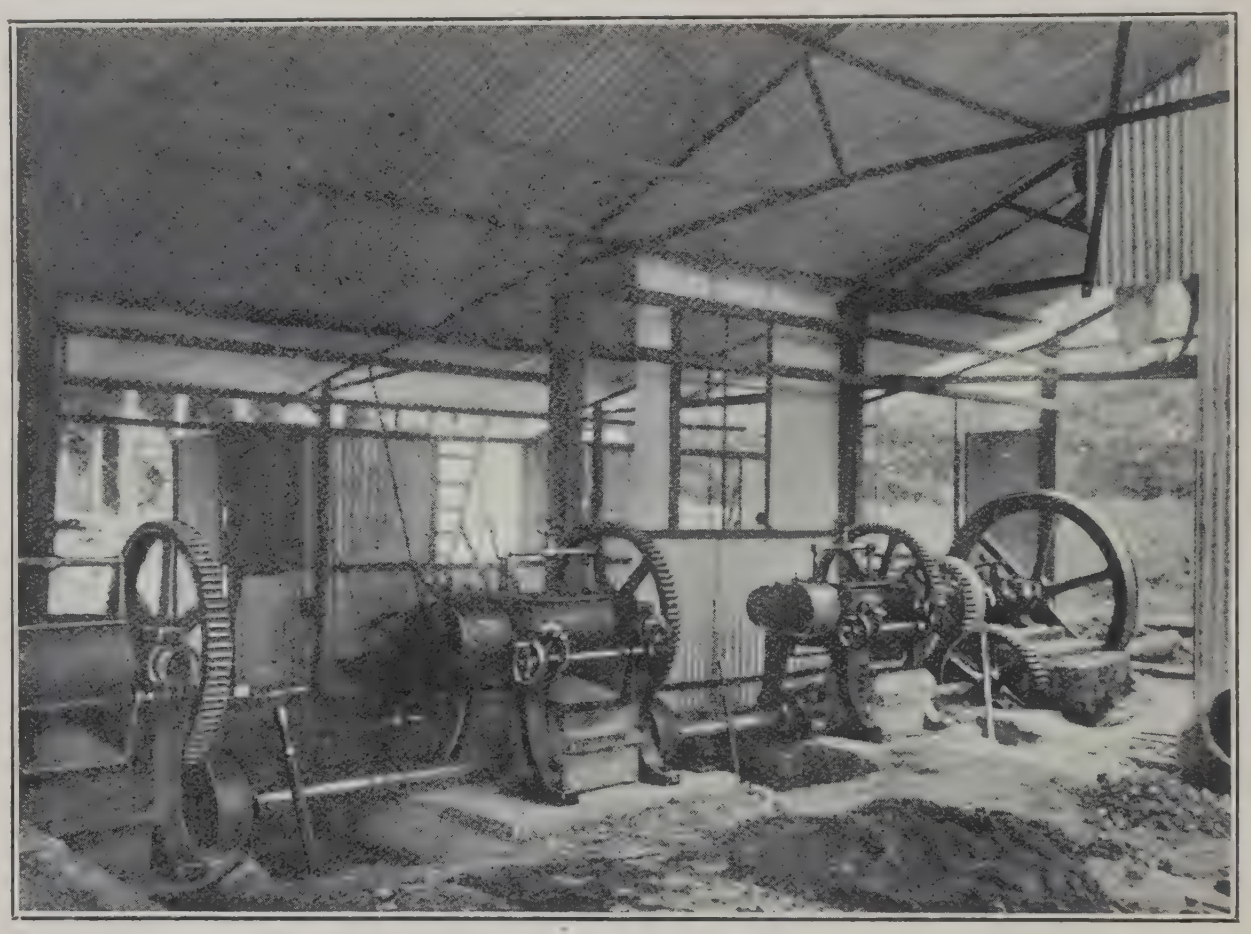
Illustration on page 104 shows the type of native engaged in the plantation work and for tapping of the trees. The labour problem in German East Africa is somewhat serious. At present it is not possible to engage labourers for a longer period than six months, or, seeing they are of a lazy type and never work a full week of six days, the engagement cannot extend beyond eight months. This is a distinct disadvantage to planters. It is held that the engagement should not be for less than one year at the least, and for two preferably.

The Manihot Rubber Plantations, Ltd., owns a considerably larger area than the Mkumbi Rubber

Plantations, Ltd., we believe, in all close upon 2,000 acres. Of this acreage about 1,025 acres are freehold and the remainder leasehold. This leasehold land will be fully converted into freehold within a very short period. The law in German East Africa is that for every acre planted two acres of leasehold shall become freehold, that being the reward for rapid planting.

When the Company was formed on June 21st, 1910, 432 acres of the entire area were planted with 137,500 rubber trees (*M. glaziovii*). Only 37,500 of these trees were actually fit for tapping at the time of the Company's formation. The balance have since become tappable.

The Company has since cleared and is now planting over 500 acres, so that in addition to the important fact that at least 150,000 trees are now or will be within the very near future added to the Company's stock of trees the whole of the land is in a position to be declared freehold. This Company also has considered it expedient to plant wider, preferring to have steady, good results rather than to over-crowd the land. Should experience demonstrate that closer planting is safe it is very easy to interplant with young seedlings and so increase the number of trees.



Interior of part of Cleansing Factory.

The Company is further proceeding with the clearing of land, and in all at least another 250 acres will be planted with rubber trees during the present year, thus bringing the minimum number of trees which the Company will then possess up to at least 400,000 trees.

The Company has also determined to make an experiment with the growing of coconut palms which, because of the nature of the soil and the comparative close proximity to the sea coast, flourish in a wild state in the neighbourhood, and ought therefore in cultivation to yield excellent results.

The Soya bean is also to be experimented with, partly as a smother crop and partly as a permanent crop upon a portion of the estate.

The illustration on page 105 shows the particularly healthy condition of young trees of the *M. Glaziovii* species in wide planting.

As stated on page 104 the two Companies now under discussion have erected a rubber cleaning factory and commenced operations. The illustration on this page shows the rubber cleansing factory in process of erection.

The latex will be conveyed into Tanga immediately after collection and treated before the rubber has become fully coagulated It is expected good results will accrue from the treatment of the latex in this condition, and the two companies intend to market their rubber in future as Manihot-Mkumbi and Manihot-Manihot, that is, printing their names in full on their block rubber, as is done with all leading estates, rubber or cacao.

Both Companies have excellent houses for their plantation managers. They are now stated to be settling down to steady work, and with anything like reasonable prices seem to be assured of a successful commercial future, and will, we believe, offer a good object-lesson of what can be done with Ceará rubber, and the yield to be obtained under careful management.

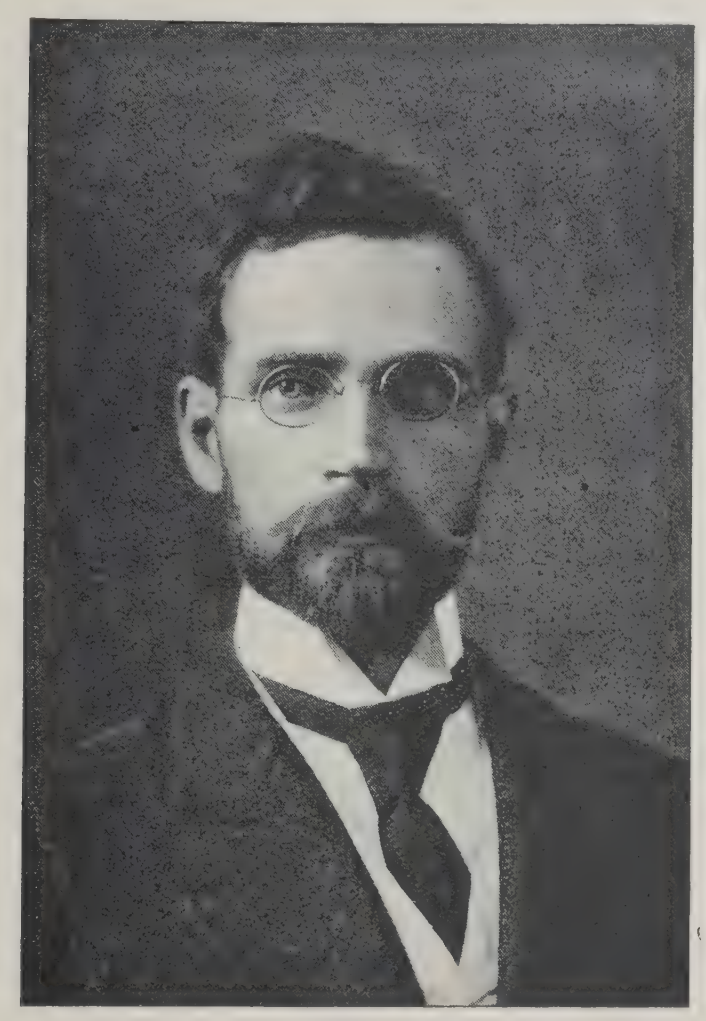
The rubber-cleansing plant above alluded to is of much greater capacity than the present requirements of the two companies. Cleansing will, we understand therefore be undertaken for the owners of private plantations.

These two companies are exhibiting in combination at the Rubber Exhibition, at Stands 113 and 114, King George's Hall, Agricultural Hall. At the time of writing the exhibits had not arrived at the Stands, but we are informed they are expected to be here, as to a large portion, in time for the opening day, and as to the balance, shortly afterwards.

"THE Whole Art of Rubber Growing," by W. Wicherley, F.R.H.S. (see advertisement, page xxxi) has come to hand too late to review in this issue. We can, however, say that no one interested in Ceará rubber (*M. glaziovii*) can afford to be without it, as a large portion of the book is given up to discussing this variety, how to plant and tap it. Pará, Castilloa, and other kinds are also dealt with. We shall be pleased to forward a copy to any address on receipt of a remittance for 5s. 6d.

The Death of Dr. Pehr Olsson Seffer.

TELEGRAMS to hand early in May reported the death, under distressing circumstances, of our old friend Dr.



The late Dr. PEHR OLSSON-SEFFER.

Pehr Olsson-Seffer, the well-known Castilloa expert. At the time, owing to the meagre and contradictory accounts to hand, we waited for written accounts before reporting the matter. These have now come to hand from Mr. J. L. Hermessen, who sent us the *Mexican Herald* of May 1st, with full details.

After writing to us, for his last letter was dated April 29th, Dr. Olsson-Seffer must have on the same day boarded the train to proceed to Cuernavaca. At El Parque, 28 kilometres on the Mexico City side of Cuernavaca, some rebels held up the train and wrecked and riddled it with bullets. Details are missing as to what actually happened, but it is agreed that Dr. Olsson-Seffer was first shot in the face without being killed, and later from behind. None of the other passengers seem to have been shot, and, stripped of their valuables, they finally reached Cuernavaca, when soldiers were despatched to El Parque. Here they found Dr. Seffer's body, which they picked up, and tying it across a mule, took it down by the mountain trail to Cuernavaca.

We greatly regret to hear the news, and beg to offer our sympathies and condolences to the doctor's family and friends. Dr. Olsson-Seffer, like all leading men, had his critics, but there is no doubt he was a hard worker, and if at times he appeared over optimistic of Mexico's possibilities, it was only because he was aware what that country could do if given a chance, but unable to realize that the necessary chance had not yet come.

The Increased Demand for Nitrates and Potash in United States of America.

THE *New York Oil, Paint, and Drug Reporter*, in commenting on the fertilizer market, calls attention to the very large increase in the importations and deliveries of nitrate of soda and other nitrogenous chemical manures into Atlantic coast ports during the last five years, and to the remarkable expansion of the American fertilizer industry generally during that period.

Nitrate of soda, being by far the most important of the nitrogen-carrying chemicals used in the manufacture of artificial manures, the increased consumption of that product can be regarded as a reliable criterion of the expansion of the fertilizer industry as a whole. Privately compiled statistics record total deliveries at Atlantic coast ports during the first four months of 1911 to the amount of 194,522 tons. This figure compares with 81,384 tons and 70,030 tons during the corresponding periods of 1907 and 1908, respectively. Thus in the period between 1907 and 1911 there has been an increase of more than 125 per cent. in the actual deliveries for consumption of the soda salt. The ratio of increase in the importations has been much larger, being close to the 300 per cent. mark. As but 15 to 25 per cent. of the imports of chemical is used in the manufacture of nitric acid, glass and explosives, and as these industries have not shown more than a normal rate of expansion during the last five years, the increased importation of nitrate of soda must be credited to the fertilizer trade, and that this is so, is undoubtedly owing to the excellent work carried out by Dr. Wm. S. Myers, in showing agriculturists the necessity, or at least the advantage, of supplying adequate quantities of this plant food to their crops.

Coming to potash, the imports of all classes of this article have increased more than $66\frac{2}{3}$ per cent. during the last two years, and here again the fertilizer industry has been the source chiefly responsible for the heavier tonnage. The only reflection of the differences that have arisen between producing interests is to be found in values of imports which have not increased in proportion to quantities, owing to the large amounts of cheap independent potash shipped to this market. Needless to say, Germany maintains her monopoly of this important plant food. The Austrian deposits have not been explored to any extent, and Austria continues to be a large importer of German potash.

The Southern States are by far the largest consumers of manufactured fertilizers, and with the development and expansion of the cotton and corn raising States the fertilizer industry gives promise of a proportionate growth. Artificial manures have played no part in the development of the soil of the Western States, but with repeated crops of land-exhausting products the time will be near at hand when this section will also be a large consumer of fertilizers, and those needing supplies should buy whilst prices are low.

THE African Rubber Company, Ltd., has been awarded a prize at the Accra Agricultural Show for their exhibit of Robusta coffee grown on their plantation at Axim.

Improved Methods of Tapping Funtumia.

By R. BARRY BAND.

IN the February number of TROPICAL LIFE extracts were published from the Gold Coast Government's Agricultural Report for 1909 on methods employed in the tapping of Funtumia trees. It is regrettable that those experiments and their results should have had such prominence given them; the yield per tree is poor and inclined to discourage the planting of Funtumia, unless other methods of tapping can show better and more remunerative results. Though very little detail is given in regard to these Gold Coast tapping experiments, similar experiments carried out in other parts have resulted in the trees yielding practically no measurable quantity of latex at the end of the sixth and seventh tapping. The intervals that were allowed between the tappings were about a week. The above experiments, like those conducted by the Agricultural Department of the Gold Coast, were conducted on the cutting-out principle, or, in other words, the excision method. By the excision method of tapping, a large quantity of bark is removed and often parts of the cambium, as is very noticeable in trees tapped by heavy-handed natives. Trees tapped on the excision method take many months to heal, and some time must elapse before a subsequent tapping can obtain the previous yield.

In the Forestry and Agricultural Report of Southern Nigeria for the year 1909, the Conservator of Forests reports that "taking it all round, however, the experiments carried out with the excision method have been very disappointing. Trees tapped last year for the first time, and tapped on the same area this year, gave only one-tenth of the amount of latex yielded last year."

This extract shows, in conjunction with the Gold Coast results published in February TROPICAL LIFE, that the excision method of tapping is not the best method to adopt for Funtumia. The incision method of tapping, as it becomes known, is fast taking the place of the excision method. The incision method of tapping admits of the Funtumia tree being tapped three times a year without showing any great difference in yield of latex at each tapping. This incision method has got a strong advocate in Dr. Cuthbert Christy, who has devoted some years to the study of Funtumia and has just published a valuable book on the subject which should help to dispel many of the erroneous ideas that exist about the cultivation and tapping, &c., of Funtumia, and the yields to be expected.

In connection with the tapping of Funtumia on the incision method, Dr. Christy patented a knife in 1907, which comprises a knife and pricker secured at opposite ends of the handle, so as to permit of the successive use of knife and pricker without inconvenience. By the angle of the knife, which is used for making shallow channels just deep enough to allow the latex to flow down the tree, it is impossible under ordinary circumstances for the operator to cut more than one-third of the thickness of the bark, and the width of the channel is 2 mm. (fully 1-16 in.). The channels thus made are then pricked with the pricker, which induces a rapid flow of latex. The operator should always see that the teeth of his pricker are sufficiently thin and sharp so as to cause as little displacement of living tissue or other injury so that rapid healing may ensue.

There are two systems of tapping on the incision method that are recommendable, namely, the "double half-spiral" and "v rtical." But if one is to be guided by actual yields, the "double half-spiral method" gives the best results and is likely to be the system generally adopted on plantations. To tap a tree on the "double half-spiral" method one starts by making a vertical or perpendicular channel to the desired height, and then side channels alternately about 10 in. apart, at an angle of 35-40°. Care should be taken to see that the side channels do not overlap on the side of the tree opposite to the vertical channel. The side channels only are pricked, and not the vertical ones, for if pricked it would interfere in subsequent tapping with the successful flow of latex from the side channels crossing it. Subsequent tapping operations can be carried out at intervals from three to four months, the vertical channel and laterals being 1½ to 2 in. distant from previous tapping; the side channels again being only pricked. The "vertical method" of tapping can be carried out quicker than the above method, but its yield of latex is not so satisfactory. It consists of making four vertical channels equidistant on the four sides of the tree and pricking them. Subsequent tappings may be carried out as recommended for the half-spiral method, and at the same distance apart.

The results of some experiments carried out on trees eight years old, that were planted in lines cut through the bush, and the bush only removed after the trees were over four years old, may be of some interest, and though the results are poor it must be remembered that only a portion of the tree was tapped. The tapping experiments were conducted between 6 and 7 a.m., and the total length of cuts in each experiment was 8 metres (26 ft.). In the "vertical" system four equidistant channels were made of 2 metres each and pricked. In the "double half-spiral" system lateral channels were made at an angle of 35-40°, with vertical channels alternately and about 8 in. apart. The

DOUBLE HALF-SPIRAL METHOD.

	Girth of trees*		Length of time between tappings	Yield of latex		Dry rubber		Total yield per tree
	First tapping	Second tapping		First tapping	Second tapping	First tapping	Second tapping	
	in.	in.		c.c.	c.c.	grm.	grm.	grm.
	19¾	20¼	10 weeks	89	44	40·	13·3	53·3
	18	18⅝	12 ,,	76	61	33·65	7·4	49·69
	18½	19½	12 ,,	81	35	35·75	14·5	49·80
	19¼	19⅝	19 ,,	100	62	46·06	21·6	67·12
Total ...	75½	78¼		346	202	155·46	56·6	219·91
Avg. per tree	18¾	19½		86·5	50·5	38·865	14·15	54·977

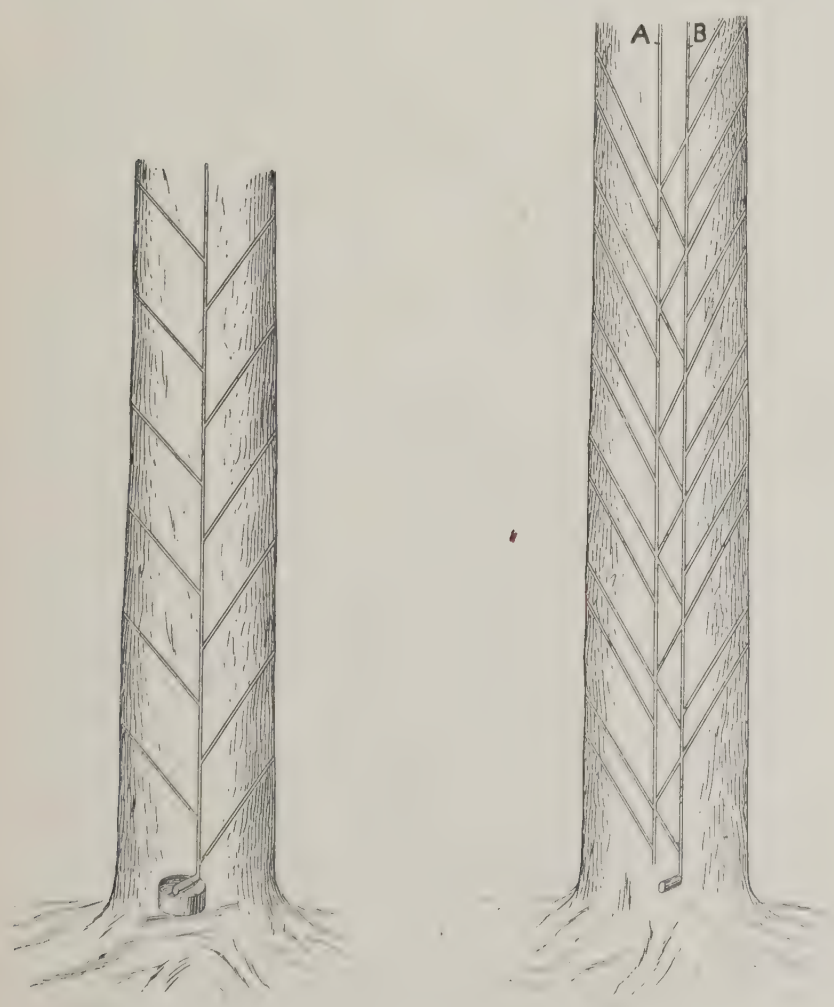
* The girth of the trees was taken at 3 ft. from base, and for trees eight years old the girth is poor, that being largely due to the bush being allowed to grow between the trees until after the fourth year.

VERTICAL METHOD.

	Girth of trees		Length of time between tappings	Yield of latex		Dry rubber		Total yield per tree
	First tapping	Second tapping		First tapping	Second tapping	First tapping	Second tapping	
	in.	in.		c.c.	c.c.	grm.	grm.	grm.
	19½	20	7 weeks	50	36	21·6	15·9	37·5
	18	18½	12 ,,	74	51	35·6	18·	53·6
	18½	19¼	16 ,,	80	48	35·75	17·7	53·45
	19¼	20	19 ,,	72	59	30·4	22·	52·4
Total ...	75¼	78¼		276	194	123·35	73·6	196·95
Avg. per tree	18¾	19½		69	48·5	30·837	18·4	49·237

lateral channels only were pricked, and the total length of channels pricked in double half-spiral system was 6 metres, the vertical channel being 2 metres long. The tapping knife used was Christy's Funtumia knife.

On examination of the above tables it will be noticed that the yields from the second tappings are less than the first tapping; that is accounted for by the fact that the channels in the second tapping were made too close to the channels in the first tapping, they being in many cases less than an inch apart. But if the subsequent tappings are carried out at the distance apart previously recommended—1½ to 2 in.—equal if not better results will be obtained than those recorded from previous tappings. It must be remembered, of course, that Funtumia trees can be tapped to nearly two-thirds of their total height, and the writer has seen *Funtumia elastica* trees growing in the forest that have been tapped up to between 30 and 40 ft., the total height being about 60 ft.



HALF-SPIRAL TAPPING FOR FUNTUMIA.
A, first tapping; B, second tapping, 1½ to 2 in. to right of A.

The Development of Nigeria.

RECENT RAILWAY CONSTRUCTION.

A DINNER of the African Society was held recently at the Trocadero. Sir Clement L. Hill, M.P., presided, and the principal guests were Sir H. Hesketh Bell (Governor of Northern Nigeria) and Sir Joseph Ward (Premier of New Zealand). Others present included Sir T. Fowell Buxton, Sir Charles Walpole, Sir Horace Regnart, Professor Wyndham Dunstan, Mr. J. Cathcart Wason, M.P., Mr. F. Swanzy, and Mr. H. d'Egville.

Sir H. Hesketh Bell, replying to the toast of his health, proposed by the Chairman, said that first and foremost in the line of progress in Northern Nigeria stood the construction of the Baro-Kano Railway, which was opened only three weeks ago. Though a good deal remained to be done, the total cost of the project would only slightly exceed Sir Percy Girouard's original estimate of £3,000 per mile, and it would have the merit of being by far the cheapest railway ever constructed in tropical Africa. The line from Lagos, which was being constructed by the Southern Nigeria Government to join up with the Baro-Kano Railway at Nunna, was rapidly nearing Zungeru. A branch line was to be constructed from Zaria to the tin fields, and it was hoped that within eighteen months they would be able to transfer to the exhilarating air of the Bauchi highlands all sick or debilitated Europeans who might require a change from the enervating atmosphere of the low-lying coast.

Sir Rubert Boyce* (Dean of the Liverpool School of Tropical Medicine), who was unable to be present, sent a paper dealing with his recent investigations in connection with yellow fever in West Africa. He stated that he was strongly of opinion that yellow fever was endemic among the natives, as shown by the fact that epidemics did not occur among them, and the remedy was segregation and mosquito destruction.

THE quality of plantation rubber, reported Messrs. Wilson, Smithett and Co. in their annual rubber report, has continued on the previous high level, but again we must note an occasional tendency to tap immature trees. The weak rubber thus produced is detrimental to the welfare of the industry, as manufacturers receiving consignments, unsatisfactory in this respect, view with suspicion future shipments from the same source. Care must also be taken to avoid mixture in qualities, as in some instances slightly mottled and streaky crêpe has been packed with pale, and a material difference in price was in consequence realized.

* Since writing the above, we regret to report the death of Sir Rubert Boyce, which took place suddenly from cerebral hæmorrhage on June 16th.

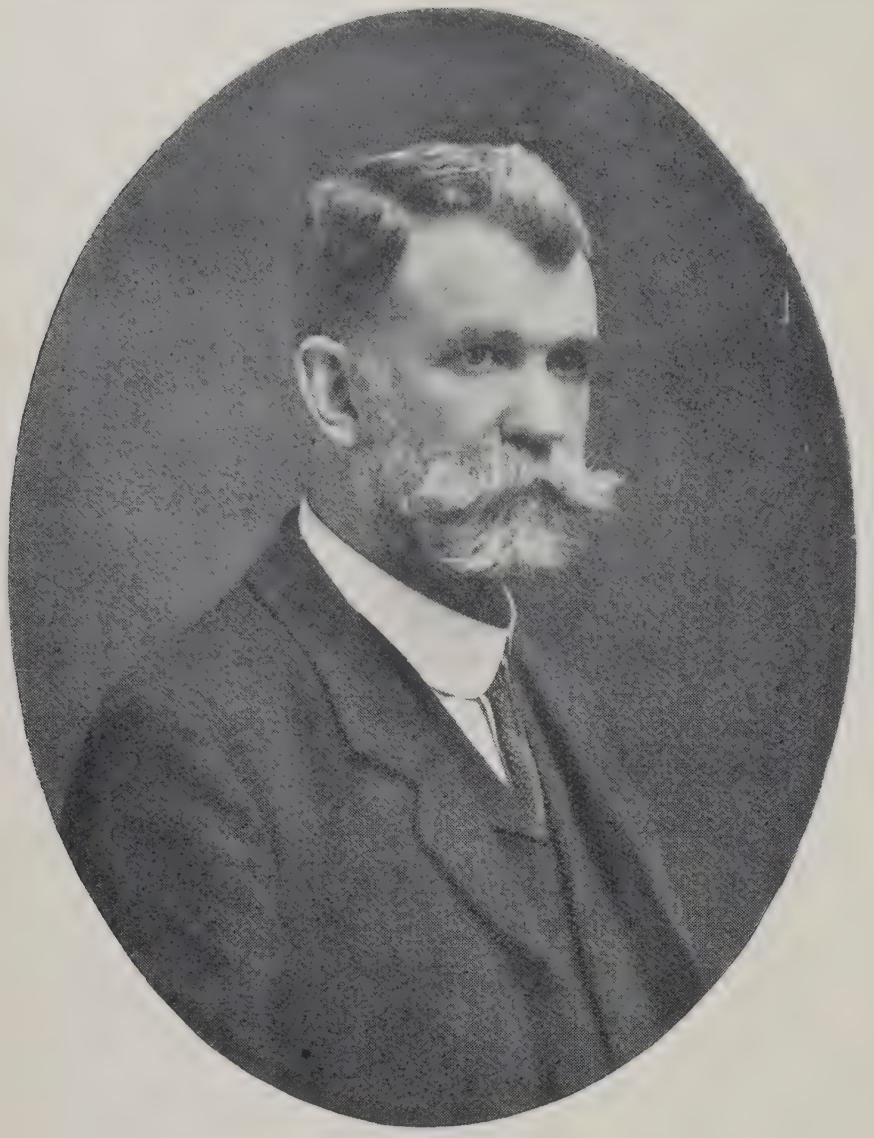


Photo by Canadian Studio, 54, Victoria St., S.W.

"Tropical Life" Friend.—No. 72.

ROBERT WALLACE, F.L.S., F.R.S.E., &c., &c.

Professor of Agriculture and Rural Economy in Edinburgh University; *Times* Correspondent, and Author of numerous works on Agriculture at home and abroad.

INTEREST has been centred of late in a series of important articles on rubber, written by "Our Friend" this month, and published by *The Times*. We can only hope that they will be continued, as the information to be obtained from them at this period in the history of rubber-planting, of good and bad propositions, well-managed and badly-managed companies, or good yielding and poor yielding trees, cannot be over-estimated. The attention that the articles are attracting, the comments, *pro* and *con*, and the criticisms levelled at the ideas and statements contained in them, shows the advantage of a leading daily paper trying to educate the public in the art of practical tropical planting.

Although one can honestly say that Professor Robert Wallace stands for expert agricultural practice in Scotland, his name and reputation is not confined to the "land of cakes," his influence being known and acknowledged in all parts of the Empire as emanating from a practical agriculturist—born and bred.

Professor Wallace is no "little Englander." You need not talk half an hour with him to find this out. It would be easier to point out the leading agricultural centres where he has not been, than to try and enumerate those that he has visited. Physically and mentally he appeals to us as the embodiment of perpetual motion, and as the time when we met the Professor, he was, unfortunately, far from well, we left wondering how much he was capable of getting through, when allowed or able to work at "full steam." Speaking from memory, "Our Friend" has studied rubber (and agriculture generally) in the Middle East, French Tonkin, Federated Malay States, Java, &c., also in Mexico, whilst on ordinary agricultural matters he has travelled (sometimes more than once) through Europe, British Columbia, Canada, and the United States, South Africa (including Rhodesia), Australia, New Zealand, Argentina, Egypt, &c., it having become almost a habit with him, as soon as the University classes are closed in spring, to betake himself overseas, to learn new ideas and refresh his memory regarding old ones, in order to give of his and the world's best to the students who gather around him. When the idea of a tropical agricultural college becomes an established fact, Professor Wallace will give it his most cordial support. We know of no man so capable as he is of combining the theory and practice of agriculture as practised in the tropical and temperate zones alike.

At the moment "Our Friend" is Professor of Agriculture and Rural Economy in the University of Edinburgh, whilst for the last quarter of a century he has been recognized as the leading academic representative of the agricultural interest in Scotland. The second son of an extensive farmer and landowner, early surrounded by agriculturists, he has had a thorough training, practical and academical, first locally, and then at Edinburgh University and elsewhere. Later we find him filling the chair of agriculture at the Royal Agricultural College, Cirencester, and in 1885 he was called to his present position at Edinburgh University, where the first chair of agriculture in the United Kingdom was established in 1790. This proved a far-sighted and important addition to student and *Alma Mater* alike.

As already stated, to qualify himself—according to his own standard—the Professor has scoured the world to learn first hand what others are doing and how they do it, and covered over 300,000 miles in foreign travel in achieving his object.

To lecture on Indian agriculture, he argued, one must understand both agriculture and India, and the relations between them, so he hied him hence to study them. A student from Canada or from Australia can only be properly trained by one who knows the actualities of those colonies, and so he visited those colonies also, and more than once. Of his work abroad, Professor Wallace will always be best remembered on account of his interesting discovery, made in India, in 1887, that a black skin is to be found under the white coats of cattle and other animals in the Tropics. As a protection against the rays of the sun, that is, like the native, their skins are black. The publication of this discovery called forth complimentary comments from Professor Huxley.

"Our Friend's" works include: *Farm Live Stock of Great Britain*, 4th edition, published 1907. *Indian Agriculture*, first issued as *India in* 1887. *The Rural Economy, and Agriculture of Australia and New Zealand*, 1891. *Farming Industries of Cape Colony*, 1896. *Argentine Shows and Live Stock*, 1904. The Animal Section of the Board of Agriculture's *Handbook of British Live Stock*. Article on "Agriculture and Farm Animals" in the *Encyclopædia Britannica*, &c., and several others of equal importance.

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All **literary communications** should be addressed **to the Editor,** and accompanied by the necessary stamps for their return if not accepted.

3.—All **business communications and payments**, either for subscriptions or advertisements, should be sent **to the Publishers** of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is **Ten Shillings** per annum, may commence at any time, and is payable in advance.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed to the Manager of the Department.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

JUNE, 1911.

English Trade Abroad.

THE EXPORT OF ENGLISH CAPITAL, AND ITS EFFECT ON THE WELFARE OF THE EMPIRE.

MR. ASQUITH, the Prime Minister, presided at a dinner given by the members of the Liberal Colonial Club, to Sir Edgar Speyer, in the spacious rooms of Prince's Galleries, Piccadilly, to hear this leading financier's views on "The Export of English Capital, and its Effect on the Welfare of the Empire." The galleries, spacious as they may be, were almost uncomfortably crowded, but the dinner was a good one, the floral decorations beautifully arranged, and the company both interesting and attractive, so a thoroughly enjoyable evening was spent, and it was generally agreed that the club has come "right there" to the front of the Empire-building institutions of to-day. Had it not been that two very strong counter-attractions were held the same night, viz., His Majesty's Court, and the annual dinner of the Royal Colonial Institute, presided over by H.R.H. the Duke of Connaught, at which the Colonial Premiers over here for the Imperial Conference and the Coronation were entertained, the attendance at the club's dinner would have been even larger.

As it was, some 300 guests were present, including Sir West Ridgeway, G.C.M.G., the Chairman of the Club; Miss Asquith, Lady Speyer, Lord and Lady Farrer, Lord Brassey, Lord Furness, Sir Felix and Lady Schuster, Sir Alexander and Lady Lawrence, and a large number of members of Parliament.

As the question of the development of our trade in the Tropics and our Overseas Dominions has always been the chief cause of our existence, our Editor not only made a point of attending but took several guests interested in the opening up of the Tropics and extending our import and export trade. These included Mr. Walter Davidson, C.M.G., the Governor of the Seychelles; Mr. (now Sir) W. H. Lever, ex-M.P. for the Wirral Division of Cheshire; and Messrs. Harcourt Paine, Leslie Radclyffe, and Victor Hamel Smith.

In the course of his remarks, Sir Edgar Speyer fully endorsed all we have written in this Journal and elsewhere, or urged at our lectures, on the absolute necessity of this country liberally supporting commercial and agricultural undertakings abroad if we wish to remain in the forefront of the nations, to assure our supplies of raw materials and food, and to find adequate and remunerative employment for our people from the highest to the lowest. The remarks* showed that, at any rate, during the last five or six years the supply of English capital that has steadily flowed to the Tropics has been unstinted. In rubber estates alone, some £50,000,000 of our money has, we believe, been actually paid up, out of a nominal capital of over £70,000,000. It only remains for us, therefore, to train the rising generation in such a way as to fit them to take charge of this splendid heritage oversea, and to see that they push it on and make it an everlasting success. Sir Edgar Speyer referred to Lord Furness's recent letter to the *Times*, which he entirely endorsed. New conditions require new methods, and commerce and agriculture to-day demand a most highly-trained army of workers. What is wanted is fitness and the bringing up of a generation with sound bodies and strong muscles, alert minds, and adroit hands, and there are welcome signs that these matters are going to be dealt with, and that the Government is fully alive to them.† From 1894 to 1904, we are told, Great Britain spent a great deal of money on unproductive, if necessary, purposes, but since 1905 she again began to invest in foreign securities, with the consequences that our foreign trade has grown by leaps and bounds, and the raw material needed for our industries vastly increased, whilst the prosperity and level of comfort and purchasing power abroad has been considerably augmented. There is still plenty of capital to come, and as the English people have at last realized that their very existence depends on supplementing their small supplies of food-stuffs and raw material by encouraging other centres to produce that which they were in need of, prospects for the future looked pleasant and assured.

We agree with all this, and since no one can deny that agriculture is, always has been, and always must be the profession of the vast majority of the inhabitants of this world, this country, therefore, since it owns or dominates so large a portion of the earth's surface, is bound to foster her agricultural undertakings if she wishes her commercial ones‡ (loans, ships,

* A full report of Sir Edgar Speyer's speech, and the discussion which followed, in which Mr. Asquith, Sir Felix Schuster, Sir Edward Holden, Mr. T. A. Coghlan (Agent-General for New South Wales), &c., took part, can be had on application to Sir Alex. Lawrence, Bart., 3, King's Bench Walk, Temple, London, E.C.

† For previous articles on this important question of training, and sending out the right class of men abroad, also the regrettable reluctance of too many of the rising generation to put up with the stress and forceful life of a planter, see "Our Plea for a Tropical Agriculture College as a Memorial to King Edward VII," January, 1911. "The Need of Imperial Labour Bureau," December, 1910. "The Emigration Conference," September, 1910. "The Rubber Boom," March, 1910. The Question of Agricultural Education," October, 1909, &c., &c.

‡ "Cities are the daughters of Agriculture and the mothers of Commerce" was Colonel Hill's picturesque description to the members of the Louisiana Planters' Association on May 11th.

railways, docks, &c.) to be successful. This is especially the case with the Tropics, not only the area under our own jurisdiction, but that belonging to other nations as well. No one can develop and make the most of tropical industries as this country can. No industry repays the labour and money expended on it as do those based on agricultural pursuits in the Tropics. Yet, until lately, the Tropics have been sadly neglected, almost entirely ignored. Even to-day they resemble, far more than they ought to, the miller's daughter who attracted the notice of the king simply because she was supposed to spin straw into gold. The Tropics, like the straw, can cause gold to come, but it does not come spontaneously, only as the result of much patience, strenuous effort, and often physical discomfiture and suffering. "Tenderfeet" are no more use for establishing estates than they are in pioneer work "out West." Like our Army, which can only be maintained at a high standard by having a sufficiency of well-trained officers in charge to organize and guide the thousands of units, of every creed and colour, so can our tropical industries only prove successful if our young men consent to be trained to take charge, and the older ones are willing to finance the undertakings. Meanwhile let us remember that capital without labour is practically useless. In order to take advantage of the millions already invested, as well as to encourage further sums to follow, something must be done to bring about the better organization of our labour supplies. There are thousands of miles of fertile land being starved for want of the crude labour necessary to work it, whilst there are millions of suitable labourers who would benefit by being placed on that land. Surely with a little care, tact, and consideration in handling the natives, the two can come together. The world is getting congested, just as it has done before, and wants a shake-up to distribute its children more evenly over the surface. Let us be warned in time, therefore, and do by peaceable methods what has too often been done by force and fighting. Modern social history can be said to have started with such an upheaval in France in 1789. Modern scientific and industrial development began fifty years later, in 1839, with the utilization of steam and mechanical appliances. Now, seventy years after the introduction of steam, comes the turn of the Tropics and the coloured races, to be utilized for their benefit and that of our own people. Empty stomachs have caused, and always will cause, more trouble in this world than hot heads, and when one looks around it cannot be denied that in nearly every portion of the globe important social upheavals, especially among the lower classes, exist. Let us therefore take the opportunity to open up, with our capital, the sluices leading to fresh channels of employment, and at once start diverting the stream of surplus labour, from here, from India or elsewhere, whether under our flag or not, so that we shall assure our tropical planters and colonial agriculturists a sufficient and reliable labour supply of all nationalities, creed, and colour to make use of the capital that we have to invest, and they need the use of, to benefit the welfare of the Empire.

Tea Planters and the Labour Question.

IN their annual review of the tea trade, Messrs. Wm. Jas. and Hy. Thompson tell us that the publication of the official statistics for the twelve months ending May 31st affords an opportunity of reviewing the history of the past season, recording its results, and of surveying the position and outlook. The period under review has proved a successful one for producers in the aggregate, although those who make common and medium tea have increased their profits to a greater extent than others. The most important factor has been the increased consumption in countries other than the United Kingdom; notably in Russia, where the greater purchasing power consequent upon prolific harvests has resulted in an increased demand for tea. The amount of British-grown tea taken outside the United Kingdom during the past twelve months exceeded last year's by 16 million lb. The majority of this increase was purchased locally, with a result that from India, despite an increase of about $6\frac{1}{2}$ million lb. in the total shipments, receipts in London have been smaller by over 8 million lb. From Ceylon the increased offtake amounted to over $4\frac{1}{2}$ million lb., coincidently with very little alteration in the quantity of China tea purchased. The result here was felt in smaller imports, which, coupled with a continuance of a good rate of home consumption, conduced to the buoyant and rising market experienced from autumn onwards, culminating in the early months of 1911 in a higher level of value for common and low medium teas than has been reached during recent years.

In our last annual review we stated that, assuming a continuance of the increased consumption both at home and abroad, and in the absence of any sign that China tea was regaining favour, the question to be considered was whether there would be sufficient tea from India and Ceylon to supply requirements. This belief has been fully justified, and although home consumption has been little more than stationary for over a year—the increased quantity used being only equal to the estimated rate of growth of our population—the large increase taken by other markets, Russia and Australasia in particular, has created a shortage here, from which the healthy state of the London market has been the direct outcome.

Following the shortage in Ceylons the attention of the trade here has been diverted to Southern Indian varieties to make up the deficiency, with the result that the increase from Travancore and the neighbouring districts has been well received, and with quality on the whole excellent, remunerative prices have willingly been paid. The average of public sales in London on growers' account is about $8\frac{3}{5}$d. against $8\frac{1}{3}$d. the previous season, and $7\frac{7}{8}$d. in 1908-9.

In contrast to the record crop in 1909 of nearly 192 million lb. from Ceylon, the output from the Island, during 1910, showed a deficit of over 10 million lb., viz., $181\frac{1}{2}$ million lb. To what extent this heavy falling off is to be attributed to the effect of interplanted rubber is difficult to determine, but as in many gardens where no rubber is grown there has

been a shortage in output, it is safe to put adverse climatic conditions as the principal cause. The quality of the teas received here has been up to the average, the proportion of commonest grades being smaller than usual. Of the entire crop gathered, 108 million lb., or 60 per cent., was marketed in London, and realized an average price of 8.20d. per lb. as compared with 8.15d. per lb. in 1909-10, and 7.86d. in 1908-9. The appreciation of and demand for Ceylon tea, as a distinct variety, continue to be shown in all quarters.

Java teas have not shown the expansion in output which was generally expected, and the total quantity marketed here has only exceeded that of last year by ¾ million lb. While unfavourable climatic conditions have to a certain extent accounted for this, it must be remembered that the acreage under cultivation can only increase slowly, for, although most of the estates own undeveloped land, the labour supply, although generally readily obtainable and cheap, yet owing to the prosperity of the natives, is not everywhere abundant, and many proprietors who also have rubber plantations hesitate to increase the area under tea in face of the difficulty of maintaining an efficient labour force for both crops. The produce has been, speaking generally, excellent; and the attention given to market requirements, both as regards manufacture and packing, is not surpassed anywhere. A feature of Javanese teas has been the consistent equality of the offerings, which ensures for them a continuance of support throughout the whole year. The majority of the estates have for some years used the finest Assam seed, and with expert cultivation and manufacture are now producing tea which ranks with that from good Indian and Ceylon estates. During the past twelve months the crop gathered has been about 40,500,000 lb., of which about 32 per cent. has been disposed of on the London market. Asia and Australia—not London nor Holland—secured the additional 4 millions exported in 1910.

The scramble for tea during the early months of the present year has drawn attention to other possible sources of future supply, and from countries not previously known as tea-producing, come rumours of planting and cultivation. We hear of operations in the highlands of British East Africa, and already a small quantity has been marketed here. In Annam there are plantations which are now in process of being equipped with the latest machinery, where experimental use of Assam seed gives promise of improved quality and quantity by degrees from this little-known territory. Natal's small crop continues to be locally used. The labour question is yearly becoming one of the most important problems to be faced in all producing countries, and with the competition created by the requirements of rubber plantations, considerable expansion in the area under tea is made difficult. How this can be overcome is a matter of particular importance, for at the present rate of development in the total consumption, progressive, not stationary, production is needed.

"Tropical Life" and the Development of the Tropics.

Like all parents whose children have done well, we note with pride the success achieved by the London Rubber Exhibition, and how necessary it has become to planters, engineers, and manufacturers alike. Thanks to the organizing ability of Mr. Staines Manders, foundations of a lasting character have undoubtedly been laid in the trenches, and along the lines that we, the originators of the idea, marked out in 1906-1907, when of all those we turned to for help, the late Dr. Pehr Olsson-Seffer, first in Mexico and later when travelling round the rubber-producing world, and Mr. Manders alone gave us any encouragement, until having got together a strong committee, Mr. Manders was able to go ahead and to finally launch the Exhibition in a manner that deservedly called forth praise from all sides.

What Mr. Manders has brought together at the Agricultural Hall is certain, as a trade exhibition, to give a great stimulus to producers and manufacturers alike, and of course to the engineers and others who look to them for orders. The Rubber Congress rendered possible by the bringing together of the leading men in all departments, who have come to London to visit the Exhibition, will, however, probably leave the greatest mark in the history of tropical agriculture generally. If to-day some £50,000,000 sterling have been paid up and invested in rubber estates since the 1908 show, the fact that the money was forthcoming so easily, and that the public showed such confidence in the promoters (a confidence not always deserved, as events in a few cases proved), was undoubtedly due in a certain extent to the educational value of the 1908 exhibition, which showed the public exactly what to expect, how it was obtained, and where it came from. They came to the Exhibition, in many instances, utterly ignorant as to whether rubber came out of the tree in the same state as they used it or not, whether the milk could be drunk like cow's milk or not, whether "tapping" was a joke or reality, and even when they knew all about the A. B. C. of rubber-planting in theory, they still had to see it in practice. The Exhibition enabled them to do this, and so when the boom came, the public could understand the technical terms of the prospectuses, and showed a much greater discretion in subscribing or not, than many of the promoters care to see. Meanwhile, the Tropics secured the benefits of the capital invested, and spots that were often a nuisance or an eye-sore, are now an ornament of great economic value; and whilst all that is promised may not be fulfilled, no one can deny that the Tropics through this boom have taken a step forward towards greater prosperity, and have secured the attention of the public in a way that would have been impossible in 1907. Such benefits once secured, will never be lost.

We therefore, like every one else, beg to offer Mr. Staines Manders our congratulations on the success already assured for this Exhibition and Congress, and which we hope and believe will benefit the Tropics in the future as much as the 1908 Exhibition has already done.

Indirectly, much of this is due to the initiative of Ceylon. Had there been no Exhibition and Con-

gress out there in 1906, we should not have had to watch mail by mail, the progress of their idea. It was when so doing that we were struck by the necessity of holding a similar but a larger exhibition in London, and so started at once, by our "leader" in January, 1906, to bring this about.

At the time of going to press, the progress made in fitting up the Exhibition was sufficient to show the importance and extent of the various exhibits. There were the tons of Brazilian "pelles" one has already heard so much of. Ceylon and Malaya are again showing signs of being the centre of attraction on account of the importance of their exhibit, whilst behind them the Dutch Government has erected a very attractive Javanese pavilion with native figures and bronze leonine animals mounting guard all round it. The German manufacturers have come out in a style that is worthy of their important industries, and close by the Belgian Government mean to range an exhaustive museum of their colonial produce. Among our contemporaries we notice *Grenier's Rubber News*, *The Rubber World* (next to TROPICAL LIFE, near the entrance), *The Times of Ceylon*, and *Industrial Notes and Queries*. The Potash Syndicate are again leading exhibitors, whilst the chief stands among the engineers will be occupied by Messrs. David Bridge & Co., Ltd., the largest private exhibitor, Francis Shaw & Co., Ltd., James Livingston (with Passburg Vacuum Dryer), Werner, Pfleiderer & Perkins, Ltd., Robert Warner & Co., Ltd., and Trewhella Bros., the Stump-puller engineers. The Venesta Co., Ltd., also are preparing an extensive exhibit of Wardian cases, rubber packing cases, &c., nearly opposite to our stand.

The Advantages of Pressed Rubber.

WE see from Mr. Hy. C. Pearson's (Editor of the *India-rubber World*) book, "The Rubber Country of the Amazon," that Dr. Huber, well known as the Director of the Museu Goeldi, at Pará, confirms Dr. Olsson-Seffer's theory respecting the improvement of raw rubber by continuous pressure. It was this theory that caused presses to be adopted so freely by some estates, as the rubber could then be left under pressure in the boxes until it was thoroughly set. Dr. Huber also emphasizes the double advantage of smoking and pressing the rubber. He explains that the greater "nerve" in Amazon smoked rubber made up into "pelles," *i.e.*, the well-known balls or "hams" from the Amazon valley, is caused by the rubber, from the time the *pelle* is first formed, undergoing a natural, continuous, solidifying pressure caused by the evaporation of the water from the outside layers, and their consequent contraction. "This theory," adds Mr. Pearson, "seemed to me worthy of note. I remember that when gathering Castilloa rubber in Panama, we rigged up some crude presses to get the water out, and in some instances, where the rubber was left for a long time, its strength was greatly enhanced." This is exactly what Dr. Olsson-Seffer maintained in 1906, when over here experimenting for the most suitable machines and factory outfits for the estates under his control. We are still of opinion, in spite of what is urged to the contrary, that the nerve and strength of blocks like those exported by Lanadron, is superior to rubber prepared in the same way and not pressed. The whole question of the putting-up of the rubber for transport and storage is still *in embryo*, but apart from the acknowledged waste from rubber surfaces exposed to the air, blocked rubber, either for transport, or stored away in warehouses waiting to be made up, has many advantages over ribboned rubber, as crêpe, &c.

Record Rubber Yield in Ceylon.

160 LB. IN TWO YEARS FROM ONE TREE.

THE BOWMAN-NORTHWAY KNIFE AND TAPPER USED.

AT the end of last February, or the beginning of March, when in Ceylon, Mr. H. A. Wickham visited Heneratgoda to see the trees produced from some of the very seeds he had brought from Brazil. "Mr. Wickham," said the *Times of Ceylon*, when reporting the visit, "was very much interested in the trees, of which only a few, however, owing to too close planting, have reached dimensions worthy of the stock from which they have sprung. The well-known biggest tree, the circumference of which has been given as 124½ in. and which has yielded a phenomenal quantity of rubber in the past two years, was a conspicuous object. The tree showed evidence of very careful tapping and is now resting to renew its bark. The tree is on the edge of the group, where its roots have had plenty of room on one side. During 1909 and 1910 it was tapped daily, Sundays and very wet days excepted, with both Bowman knife and pricker, and has established what we think must be an easy world's record yield—160 lb. of dry rubber in the two years—with no injury to the tree. The disparity between the sizes of other trees owing to varying conditions of shade and root-space was very striking. Mr. Wickham commented upon the fact that the roots were exposed in several places as the result of wash, the fallen leaves being carefully swept away, whereas they could with great benefit be used as a mulch. After seeing the original field the party were conducted by the curator to see trees being tapped in another portion of the gardens, and afterwards they visited the curing-house."

Research Work *re* the Extermination of Pests in the Tropics.

AN INVITATION TO PLANTERS TO COLLABORATE WITH THE SCIENTISTS.

IN renewing their advertisement in TROPICAL LIFE, our friends, Messrs. Robinson Bros., of West Bromwich, ask us to state that they are willing to continue their important offer to rubber and cacao planters and estate managers, and in fact to all who are charged with the welfare of tropical crops. During the past twelve months our friends have had on offer large commercial samples of their numerous insecticides, and we understand from them that considerable advantage has been taken of this, particularly by planters in Ceylon, the Straits Settlements, and the West Coast of Africa.

The first impression gained by a visit to Messrs. Robinson's works, primarily, to investigate the com-

position of the manufacture of the insecticides, &c., offered, is that the firm is large enough and progressive enough to play an important part as "medicine men" for tropical crops, and to enable them to become so they have adequately equipped their laboratories with scientific apparatus, and other accessories for efficient research work, so as to substantially back up the offer they are again making.

Of course, it must be understood that whilst the firm has no facilities on the spot for testing their preparations against the numerous insect pests and plant diseases peculiar to the Tropics, they can, and do, test them against nearly every pest and disease known in the British Isles and other parts of Europe, and they are adding to this a diligent book study of tropical insect and disease pests, plus the knowledge gained from continual contact with practical men who are frequently in England, and by being in close touch with current tropical literature. By utilizing this information they have now invented remedies which in their composition would appear to give promise of success when used overseas.

It is interesting to note that most of the ingredients in one form or another emanate from tar. The firm's knowledge of this commodity and its wonderful derivatives is probably without parallel; certainly it is not excelled. Hence the firm's judgment in using one product, or a combination of the products of tar can be confidently relied upon. Besides this, great care is taken in the manufacture of the preparations in bulk. From beginning to end this is conducted under the supervision of the laboratory staff, and final tests are made of the finished product, so that it is perfectly safe to say that a consistent high standard of quality is maintained. If planters find relief from their numerous insect and disease enemies in the employment of Messrs. Robinson's samples, they can rest assured that when they order a supply for the treatment of the whole or part of their estates, the bulk will be equal in efficiency to the test sample.

So highly concentrated is the majority of this firm's fluid preparations, that if found efficient when diluted as highly with water as the firm recommend, they are no doubt commercially possible from a cost point of view and should be universally adopted for estate use.

These are the details to be gathered from a visit to their works, all of which appear to be of the utmost importance to the planter. By the increasing expert knowledge of insecticides which they possess, and by a careful study of the needs of the Tropics, the firm is certainly doing all in its power to produce highly efficient and economical preparations. In face of the attention now being devoted to the prevention and extermination of pests, our advice is that, in the interests of himself, as well as of the estate he manages, every man responsible for the production of rubber, cacao, tea, coffee, &c., should take advantage of the offer to supply samples, and of working with planters to try and effect a cure, no matter what the trouble is, which the firm again tenders on our suggestion. So welcome a combination of manufacturer and user is certain to be the means of introducing the most efficient remedy for each and every disease.

Messrs. George Scott and Son (London), Ltd., advise us that they have transferred their head office to larger and more conveniently situated premises in Kingsway House, Kingsway, W.C., where they will gladly welcome visitors visiting London for the Rubber Exhibition, Coronation, Colonial Conference, &c., &c.

S. Nigeria has been busily engaged in conducting Pará rubber tapping experiments, and as a result is now sending home some 260 lb. of this rubber, probably forming thereby the first commercial consignment of Pará rubber obtained from a private plantation in British West Africa, possibly as yet from the whole of Africa.

With the closer attention given to the matter of stump pulling, our readers will be interested in a neat little booklet on the subject issued by Messrs. Trewhella Bros., of Birmingham, and Victoria (Australia), who have made a special study of the matter over a long range of years, especially in regard to their "Monkey Jacks." The book contains full particulars of the utility and efficiency of these jacks; so as to enable buyers to realize at a glance how suitable one or other of them is for the work to be done. With the improved machinery necessary, and the increased demand for the machines in all parts of the world, many improvements have been introduced which, whilst not affecting the cost, greatly increase the utility and power of the implements.

A little book that our engineering friends working in Latin America, Porto Rico, and other centres where Spanish is spoken, will find of use is the "English-Spanish and Spanish-English Technical and Commercial Dictionary of terms used, chiefly in the hardware, iron, steel and engineering trades," by Mr. William Jackson. Messrs. E. and F. N. Spon, Ltd., of 57, Haymarket, London, W., are the publishers on this side, and Messrs. Spon and Chamberlain, 123, Liberty Street, New York, attend to American orders. The price is 2s. 6d. net. The rapid increase in the use of cement work, reinforced cement, and iron and steel work in Spanish countries renders such a book absolutely necessary. It can easily slip into the breast pocket of a linen or cloth jacket, and includes many terms not found in the ordinary run of dictionaries, as we know to our cost.

We learn from an American source that guayule (*Parthenium argentatum*) has recently been discovered in certain regions of the Argentine Republic. No indications are given of the centres where it has been discovered, nor particulars as to the area or quantity obtainable. According to Kerckhove (see "Our Friend" in last June's issue) it is possible to cultivate guayule in Egypt, the Argentine, South Africa, &c., where miles of arid lands, at present useless, could be turned to account if the Mexican experiments to reproduce the plants from runners or seeds prove successful. Mons. Van den Kerckhove has published a brochure on the subject, and according to him a ton of guayule rubber, ready for shipment, costs fcs. 300 (£12).

Cotton.

THE following were the prices for Cotton in London on June 2nd, according to Messrs. Slann and Davies. (Owing to the Whitsun holidays no report was issued for the week ending June 9th) :—

	Good Fair.	Good.	Fine.	Superfine.	Good 1910. Compare	Good 1909.	
	d. d.	d. d.	d. d.	d.	d. d.	d. d.	
Surat kinds* ...	7 to $7\frac{1}{8}$	$7\frac{1}{4}$ to $7\frac{7}{16}$	$7\frac{1}{2}$ to $7\frac{3}{4}$	—	$6\frac{3}{16}$ to $6\frac{13}{16}$	$4\frac{15}{16}$ to $5\frac{3}{16}$	per lb.
Madras	$7\frac{1}{4}$ to $7\frac{3}{8}$	$6\frac{3}{4}$ to $7\frac{5}{8}$	—	—	$6\frac{1}{16}$ to 7	$4\frac{5}{8}$ to $5\frac{7}{16}$	—
Bengal	—	$6\frac{9}{16}$	$6\frac{13}{16}$	$6\frac{15}{16}$	$5\frac{1}{2}$	$4\frac{7}{16}$	—
Assam	—	$6\frac{3}{4}$	$7\frac{1}{4}$	$7\frac{3}{4}$	6	$4\frac{3}{4}$	—
China	—	$6\frac{1}{2}$	$6\frac{7}{8}$	$7\frac{1}{4}$	$6\frac{1}{4}$	5	—
West Indian ...	$8\frac{1}{2}$	9	$9\frac{1}{2}$	$9\frac{3}{4}$	9	$5\frac{1}{2}$	—
Sea Island ...	12	14	17	20	17	$9\frac{1}{4}$	—
West African ...	$7\frac{5}{8}$	$8\frac{1}{4}$	$8\frac{1}{2}$	—	$7\frac{3}{4}$	—	—
East ,, ...	$8\frac{1}{8}$	$8\frac{7}{8}$	$10\frac{5}{8}$	—	$8\frac{3}{4}$	—	—

* Liverpool quotations.

In view of the approach of the Whitsuntide holidays, and the Agricultural Bureau report, which latter is looked forward to with much interest, the business of the week (ending June 2nd)—both on the Spot and for "Futures"—has been on a very limited scale. "Futures," after moderate fluctuations, have advanced 6 points. The Spot quotation is 8·33d., as compared with 8·28d. last week. East Indian for arrival is lower for Madras kinds, but there is not much alteration in other descriptions.

The import into Liverpool this week amounted to 31,910 bales, since September 1st 4,013,407, same week last year 28,560, last year's total 2,781,284 bales. The estimated Sales amounted to 23,000 bales, including "called." Middling American is quoted at 8·33d. per lb., last year 7·95d., 1909, 5·83d.

Movement of American Cotton since September 1st :—

	1910-11.	1909-10.	1908-09.
Brought into sight	11,297,000	9,883,000	13,001,000
Exports from United States since September 1st—			
To Great Britain	3,210,000	2,144,000	3,342,000
To Continent, &c.	3,775,000	3,259,000	4,310,000
Total crop	—	—	13,825,000

The latest quotations of Americans for delivery, basis middling, any port, G.O.C. :—

	June 2nd. d.	Last Week. d.	Last Year. d.
June	8·10½	7·99	7·58½
June—July	8 0½	7·90½	7·51
July—Aug.	7·94½	7·85	7·44

Sugar.

THE feature of the week ending June 8th has been, according to Mr. C. Czarnikow, the demand, notwithstanding holidays, for next crop beet, which advanced from 9s. 8½d. to 10s. to 9s. 10¾., August improving from 10s. 7d. to 10s. 9½d. to 10s. 8½d. Thus the August premium receded from 10½d. to 9¾d., but the general improvement is brought about by fears of damage done by drought in the districts of Central and Northern Germany and part of Bohemia. The districts, especially between Prague, Magdeburg, Stettin, want rain rather badly, the later sowings being very backward and here and there patchy. To-day some rain is reported in Eastern Prussia, and a change seems impending in Hamburg, which caused prices to ease.

The drought explains part of the improvement in values, the other part being due to the ever-present fears that America may want to draw upon our old crop resources. The report that 30,000 to 40,000 tons June-July Javas had been chartered with American option were unavailing to prevent a sympathetic rise, because American circulars talk of 400,000 tons foreign sugars being wanted there in September-December. We think October-December will have to take care of itself; the question is whether the old crop beet will be wanted at 9d. to 1s. premium. That again depends on the quantity of Philippine and Java sugar which may be attracted in time. If October beet remains at the present quotation, equal to about 4.08 cents New York, it may just happen that Cuban holders will insist on raising their prices (whilst all forecasts are based on the assumption that Cuba will continue to sell cheap), and then Eastern sugars, perhaps even some beet, may have to be attracted. Therefore it is probable as well that a beginning with chartering has been made, as there will be plenty of inquiry for more. Here we can probably spare some sugar if Russia sells, but in May only 4,500 tons Russian arrived. We calculated some time ago that Europe on May 31st might still have 300,000 tons excess in stocks, and with the addition of Russians we may not be able, if Java continues selling, to work this down to last year's level, unless America sends some orders. But if the fruit crop is as good as expected, the outlook is not at all discouraging, though with a large country like America and with uncertainties in Eastern shipments, it is never safe to forecast United States requirements within 50,000 tons.

In actual sugars business was moderate, 88 per cent. selling at 10s. 5¼d. to 10s. 7½d., but hardly anything doing in seconds, nominally quoted 9s. to 8s. 10½d. More transactions took place in distant Javas, No. 17

analysing nett probably 96 per cent. selling at the parity of about 11s. c.i.f., whilst beet analysing 8 per cent. less is held for 10s. 10½d. c.i.f.

The American market has been fairly active, and a good business was done in Cuban and Porto Rico sugars at 3.86 to 3.92 cents. The spot quotation for Centrifugals has been raised to 3.89 cents=11s. 7½d. c.i.f. for 96 per cent. Cubas=10s. 1½d. c.i.f. for 96 per cent. Java=9s. 1½d. f.o.b. Hamburg for 88 per cent. nett beet. The landings in the three ports for the week were 40,000 tons, and meltings 55,000 tons, reducing stocks to 267,000 tons.

Cane sugar in the United Kingdom has met with a better demand, and 96 per cent. Centrifugals command rather higher prices, viz., 11s. 1½d. to 11s. 3d. floating, landing. There have been no auctions during the week owing to the Whitsun holidays, and privately hardly any business has been done in grocery crystallized.

From cane producing countries there is no special feature to report. On this side sales include:—British West India.—Crystallized Trinidad, good middling yellow 15s. 3d. to 15s. 6d. duty paid. Crystallized St. Lucia, middling yellow, 15s. 1½d. Demerara Syrups, middling soft yellow, 12s. 9d.

In Liverpool.—985 bags grainy Peruvian sold at 11s. 4½d. to 11s. 7½d.; 6,300 bags Mexican at 11s. 6d. to 11s. 9d. quay terms telquel; 1,640 bags Brazilian at 8s. 4½d. to 8s. 9d. quay telquel.

Rubber Share Market.

According to Messrs. Zorn & Leigh-Hunt, the gamblings of several none too powerful operators in the raw material played sad havoc with the realizable value of investors' rubber share holdings up to the end of May. As the result of the financial trouble of the speculators in question, the prices of Hard Fine Pará has come down to 3s. 11d. per lb. Though the very best Plantation stuff fetched 5s. per lb. at the recent auction, the price of average parcels is about 4s. 5d., and shareholders are asking "How much lower"? Inasmuch as the price (3s. 11d.) of Hard Pará is beginning to show only a comparatively small margin of profit to Brazilian merchants—reckoning the collecting cost at 2s. 6d. per lb.—we think that the end of slumping prices must be getting near. Whatever may happen in the immediate future, it is pretty certain that the amount of money available for the dispatch of the Amazon collectors for next season's output will be greatly restricted by the present state of affairs, and this means a considerably diminished Brazilian output. A smaller production of wild rubber and an increasing consumption do not mean permanently lower prices for rubber, and when the turn comes we look for sharp movements in both material and shares. The advance in the output of plantation rubber for the next twelve months or two years is not likely to be large enough to affect this result. We strongly commend to the attention of investors in the rubber planting industry the lucid and common-sense statement of the whole position made by Mr. Arthur Lampard a day or two ago in the course of his speech as chairman of the annual meeting of the Malayalam Company. A full report of his speech appeared in the financial papers. Mr. Lampard pointed out that, upon the occasion of the last great slump in the price of rubber (in the early part of 1908, at the time of the financial crisis in the United States), a state of affairs was created which led to the pendulum swinging in the other direction to such an extent that we saw rubber mount to the record high figures of last year. In March, 1908, there was heard on all sides the same sort of silly pessimistic talk as is now so much in evidence; but the rubber planting industry soon proved that it was not "done for," and those observers who can look ahead for more than a few days or a few weeks know that it is not "done for" now.

A point to which we have already called attention, viz., the dwindling margin of profit available (with three-and-eleven-penny rubber) for Brazilian rubber collectors (allowing 2s. 6d. per lb. for expenses) as an important factor likely to give pause to even the most reckless bear, has, the week ending June 8th, been emphasized by the Press, and the argument has, without doubt, been recognized as a powerful one, justifying a belief in quickly improving values. Many investors have not been slow to take advantage of the low prices at which shares in the rubber market could be had, and nearly all changes are in the upward direction. Immediately the price of rubber showed signs of appreciation, bargain-hunters appeared in numbers very disconcerting to the bears, and prices have stiffened all round. The change which has come over the market, however, is not shown so much by the improvement in individual quotations as by the distinctly more confident "tone" which is manifest on all sides. The tremors and nervousness, which for some weeks had checked investment buying, have now passed away, and while no great activity can reasonably be looked for on the eve of the Coronation and the holiday season, the recent slump certainly seems to have come to an end, and to have left the share market in a thoroughly sound and healthy condition.

In answer to "Rubber Dividends," companies that have declared dividends of 100 per cent. and over (according to Messrs. Zorn and Leigh-Hunt's mid-April list) include:—

Anglo-Malay	100 per cent.		Inch Kenneth	100 per cent.	
Batu Caves	150	,,	Luiggi...	165	,,
Bukit Rajah	150	,,	Pataling...	325	,,
Cicely, ordinary	135	,,	Selangor	375	,,
,, preference	140	,,	Vallambrosa	250	,,
Fed. Selangor	125	,,			

50 per cent. and under 100 per cent.:—

Cons. Malay	80 per cent.		Kapar Para	65 per cent.	
Damansara	75	,,	Kepong	65	,,
Fed. Malay States	75	,,	Klanang	87½	,,
Harpenden	80	,,	Kuala Lumpur	75	,,

Last year Corea exported £584,500 of Soya beans, mostly to Japan. The Corean bean is said to be superior to its Manchurian rival, and so large an increase in its export (£200,000, or more than 30 per cent. over 1909) has released that quantity of Manchurian beans, required for the Japanese manufacturers of soys, &c., and enabled them to be sent to Europe, where the demand is rapidly increasing.

The India-rubber Market.

By MESSRS. S. FIGGIS & Co.

PRICES up to the end of May marked a further considerable decline in rubber, and the auctions of Plantation showed against previous sales about 5d. decline on good pale and 2d. to 3d. on brown and dark. Fine hard Pará went down to 3s. 10d. Transactions included:—*Plantation Malay.*—Sheets, good to fine smoked, 4s. 7¼d. to 4s. 11d.; partly smoked, 4s. to 4s. 5d.; fair to fine unsmoked, 4s. 5¾d. to 4s. 7d.; damp, pressed and mouldy, 3s. 11d. to 4s. 5¼d. Block, pale Lanadron, 5s. Crêpe, fair to fine, pale and palish, 4s. 4½d. to 4s. 7¼d.; light brown and grey, part streaky, 4s. 4¼d. to 4s. 5d.; clean brown, 3s. 11½d. to 4s. 2¼d.; dark brown, part specky, 3s. 4½d. to 4s. 1d.; black and soft, part pressed, 2s. 8½d. to 3s. 10d.; smoked, 3s. 10¼d. to 4s. 4¾d. Scrap and virgin, fair to good, 3s. 4d. to 3s. 10d.; mixed and inferior, 2s. 10d. to 3s. 3d. Rambong scrap, ordinary to fine, 2s. 4½d. to 3s. 7d.; Castilloa sheets, soft, 3s. 0¼d.

Ceylon.—Sheets and biscuits, good to fine unsmoked, 4s. 4½d. to 4s. 6½d.; sheets and biscuits, pressed and damp, 3s. 5½d. to 4s. 2d.; sheets and biscuits, Ceará, 3s. 6½d. to 4s. 2¼d. Crêpe, thick fair to fine, 4s. 5¼d. to 4s. 10¾d.; fair to fine pale and palish, 4s. 4¼d. to 4s. 6¾d.; light brown, 4s. 1d. to 4s. 4d.; dark brown, 3s. 8d. to 4s. 1d.; black and soft, part pressed, 2s. 7d. to 3s. 6d.; smoked, 3s. 11¼d. to 4s. 4¼d. Scrap and cuttings, fair to fine, 3s. 6d. to 3s. 10½d.

Mattogrosso and Mangabeira.—Fair, 2s. 9d. to 2s. 11½d.; mixed and scrappy, 2s. 3d.

Orinoco.—Oaura sheet, 2s. 10¼d.

Mozambique and Zanzibar.—Rough Manihot strips, 2s. 9¾d. to 3s. 0½d.

Tonkin.—Fair ropes, 3s. 4d.

By June 9th the market had grown firmer, but closed quiet, about 2d. below the best, with sales of hard cure fine Pará, spot, 4s. 3½d. to 4s. 1½d.; forward delivery, 4s. 5d. to 4s. 2½d.; soft cure fine Pará at 4s. 1d.; Caucho Ball Upriver sales at 3s. 6d. to 3s. 6½d.

The auctions on June 13th to 15th on the whole went well, and first latex Crêpe and Sheet show an advance of about 1d. per lb. over Tuesday's prices; but brown and dark Crêpes are about 2d. lower. Business included: Hard fine Pará, quiet, near 4s. 2d.; August to September, 4s. 3d. Soft fine Pará, about 4s. 1d. Negroheads scrappy Manaos, about 3s. 6d. Island and Cameta nominal, 2s. 8d. and 2s. 10d. Caucho Ball Upriver, quiet sellers, at 3s. 5½d.

Of Plantation Malay, 258 tons offered, all sold. Sheet, fair to fine smoked, 4s. 9½d. to 5s. 2d. Partly smoked, 4s. to 4s. 6¾d. Fair to fine unsmoked, 4s. 10d. to 5s. 1½d. Damp pressed and mouldy, 3s. 11d. to 4s. 9½d. Crêpe: Fair to fine, pale and good palish, 4s. 8d. to 5s. 1½d. Light brown and grey, parts streaky, 4s. 2½d. to 4s. 7d. Clean brown, 4s. 0¼d. to 4s. 4½d. Dark brown, part specky, 3s. 4¾d. to 4s. 3¼d. Black and soft, 3s. to 4s. 1d. Smoked, 3s. 10d. to 4s. 8d. Scrap and Virgin, fair to fine, 3s. 8d. to 4s. 1d. Rambong Crêpe, 3s. 11¾d. to 4s. 2½d. Scrap, 3s. Castilloa sheet, soft, 3s. 9d.

Thirty-eight tons of Ceylon were offered and sold. Sheet and biscuit, fair to fine, unsmoked, 4s. 10½d. to 5s. 1d. Damp and pressed, 4s. 2½d. to 4s. 6d. Ceará, 3s. 6d. to 4s. 2½d. Crêpe, thick fair to fine, 4s. 11d. to 5s. 3½d. Fair to fine, pale and good palish, 4s. 8d. to 5s. 1½d. Light brown, 4s. 2¼d. to 4s. 6½d. Dark brown, 3s. 8d. to 4s. 3¾d. Black and soft, 3s. to 3s. 9¾d. Scrap and cuttings, fair to fine, 3s. 9d. to 4s. 0½d.

Mozambique and Zanzibar, dark pressed Manihot, Crêpe, 3s. 2d. to 3s. 4½d.

The bulk of the indigenous rubber offered was all bought in.

Pará rubber statistics for the month of May (tons):—

	Pará.	Caucho.	1911.		1910.	1909.	1908.
Receipts at Pará ..	2,130	930 =	3,060	agst	2,150	2,340	3,210
Shipments to Europe	1,090	630 =	1,720	,,	1,370	1,540	1,580
,, America	860	150 =	1,010	,,	270	1,160	1,950

Crop statistics, June 30th, 1910, to May 31st, 1911 (eleven months):—

		Pará.	Caucho.	1910-11.	1909-10.	1908-09.	1907-08.
Pará Receipts	1910-11	29,140	6,640	35,780	37,930	36,520	34,990
	1909-10	30,550	7,380				
,, Shipts., Europe		14,070	4,520	18,590	20,620	18,240	20,690
,, ,, America		11,220	1,430	12,650	16,560	18,130	13,560

Coffee.

By MESSRS. C. M. & C. WOODHOUSE.

THE public markets have re-opened, and the small supplies of Central American descriptions submitted at auction met with a good demand, and were mostly disposed of at full rates. According to Messrs. Duuring & Zoon the stocks in the principal ports of Europe on June 1st show a decrease for the month of 303,000 bags against a decrease of 233,000 bags at the same time last year. The visible supplies on the same date show a decrease of 693,000 bags, against a decrease of 369,000 bags in 1910. "Futures" opened weak, and values declined about 1s.; the decline has since been recovered, and the market closes firm at an advance of 6d. per cwt. over last week's rates. We quote:—

		To-day.	June 1st, 1911.
London ..	Santos, Sept. delivery	51s. 0d.	50s. 6d.
New York ..	No. 7 Rio ,, ,,	10·69 cents.	10·64 cents.
Hamburg ..	Santos ,, ,,	55¾ pf.	55½ pf.
Havre ..	Santos ,, ,,	68 francs	67½ francs.

The receipts at Rio and Santos from July 1st, 1910, to June 7th, 1911, were 10,269,000 bags, against 14,609,000 bags and 11,941,000 bags in the two previous seasons respectively.

Sales include the following, viz.:—

Mombasa at 63s. 6d. for smalls, 64s. to 64s. 6d. for medium, 65s. for bold.

Costa Rica at 67s. 6d. for smalls, 67s. 6d. to 72s. for middling to fine middling, 69s. to 73s. for bold.

Guatemala at 65s. to 65s. 6d. for fine fine ordinary, 67s. to 69s. for bold.

Salvador at 64s. to 65s. 6d. for smalls, 64s. to 68s. for fine ordinary to good middling, 68s. to 68s. 6d. for bold.

Colombian, &c., at 63s. for fine ordinary, 66s. to 68s. for bold.

The London Cocoa Market.

By The Editor.

I have, on several occasions, called attention to the possible, as compared to the actual export of cocoa from the Gold Coast. Last year I estimated, from reports received, that the crop might amount to 70,000,000 lb., but feeling that it was impossible to get so large a quantity out before the end of December, suggested that possibly 60,000,000 lb. might be exported, and finally 51,000,000 lb. were shipped. The shipments this year, however, from January to April, show that my original estimate was nearer the truth with regard to the Gold Coast production, as in the four months it has exported over 35,000,000 lb., and although January showed heavy exports, so can the close of the year. Meanwhile I notice that the Bahia Press has published a letter I addressed to the Director of Agriculture out there, warning them that, if they did not come to some decision about the use of mechanical dryers for their cocoa, so as to dry and reduce the heavy proportion of unsound beans in their "fair" cocoa, they would find that the increasing popularity of the Gold Coast beans with manufacturers will cause them to leave "fair" Bahias more and more alone. In face of the large exports of cocoa from our own Gold Coast colony, and also that from the Cameroons, Grenada, San Thomé, &c., which can be relied upon to turn out true "to type," those districts which turn out only "fair" Bahias will have to eliminate their unsound beans by mechanical dryers if they wish to compete successfully against the other growths.

The Hamburg *Gordian* published in its issue of May 24th an interesting table giving the relative increase of the Cameroon output against our own Gold Coast since 1894, showing that our colony has left its German competitor far behind in the race although the latter was well ahead at the start. They give every year, but I have only given some of the years, say:—

Tons of 1,000 *Kilos.*

	Gold Coast.	Cameroons.
1894	9 tons	135 tons
1900	545 ,,	260 ,,
1907	10,451 ,,	1,797 ,,
1908	14,256 ,,	2,447 ,,
1909	20,534 ,,	2,322 ,,
1910	23,111 ,,	3,800 ,,

Those, therefore, who maintain that the Cameroons have done better than the Gold Coast, have proved wrong, especially as the Gold Coast to the end of April has already shipped 15,773 tons this year.

Of other growths, receipts or exports are as follows:—

	1910. Bags.	1909. Bags.	1908. Bags.
Bahia, receipts at Bahia, Jan.-April ...	207,722	120,357	101,106
St. Thomé ,, Lisbon, ,, ...	227,834	196,004	260,755
	Qtls.	Qtls.	Qtls.
Guayaquil ,, Guayaquil Jan.-May	374,300	290,400	358,800
	1910-11.	1909-10.	1908-09.
Trinidad exports, Oct. 1-May 15 ...	181,232	197,371	199,099
Grenada ,, ,, ,, ...	54,900	60,916	57,232

In spite of complaints from Trinidad about unfavourable weather and bad crops, it will be noticed that while they were 34,000 bags behind at the end of March, they have now, as shown, only shipped 16,000 bags less, so are gaining ground according to the latest figures. Deliveries for consumption to the end of April work out as under:—

Jan.-April—	1911.	1910.	1909.	
Germany ...	18,757	16,540	15,039	tons (English).
France	8,725	7,744	7,376	,, ,,
U.K.	6,500	7,888	9,351	,, ,,
Holland	7,880	5,346	4,782	,, ,,
	41,862	37,518	36,548	,, ,,
Jan.-March—				
Add U.S.A. ...	21,720	14,519	12,360	,, ,,
Comp. Totals	63,582	52,037	48,908	,, ,,

Turning to stocks, the first thing to strike one is that the Havre stock tops 300,000 bags, or more than London, Liverpool, and Havre put together in 1909. As was expected, now that the Budget has been published (without altering the duty on raw cocoa), the London stock is being reduced owing to manufacturers drawing more freely on their purchases laying at the docks, so that on June 17th it was 126,621 bags against 131,940 bags on May 13th, the highest point. Meanwhile stocks at the end of May compared as under:—

	1911. Bags.	1910. Bags.	1909. Bags.
London, June 3	123,985	91,990	112,397
Liverpool, May 30 ...	14,799	13,151	6,742
Havre ,, 31 ...	300,226	240,674	175,513
Comparative totals	439,010	345,815	294,652

The Board of Trade figures for the movements of cocoa in the United Kingdom have at last taken a long step in the right direction. During May only the deliveries for home consumption were 3,171 tons, against 1,759 tons last year, and 1,611 tons in 1909. This, as shown below, has enabled us to show an increase over last year of 25 tons, instead of being some 1,400 tons behind, as at the end of April. Whilst being thankful for small mercies, one cannot help noting that both France and Germany show a 20 per cent. increase to the end of April this year over their deliveries for consumption in 1909. If we showed the same increase, and there is no reason, with our Colonies and overseas trade, why we should not, we should have required some 12,000 tons, instead of 9,000, as the Board of Trade figures show. It remains to be seen whether the amendments in the present Budget will increase our export trade or not. So far as I can understand the tendency may lead rather to an increase in foreign manufactured; what will happen for certain remains to be seen.

Our Board of Trade figures are:—

Raw cocoa only—	Landed.	Del'd. H.C.	Export.	Stock (May 31st)
Jan.-May, 1909—	19,157	10,962	2,615	10,602 tons
,, ,, 1910—	14,687	9,646	3,078	10,773 ,,
,, ,, 1911—	18,565	9,671	2,545	16,023 ,,
	Incr. 3,878	Incr. 25	Decr. 533	Incr. 5,250 ,,

Coming to the matter of stocks, whilst that in London has dropped since the middle of May, and

the stock for the whole of the United Kingdom has been reduced 1,000 tons during last month (17,020 tons at end of April), it will be noted that the Havre stock has taken another upward jump and stands at just over 300,000 bags, say:—

Havre Stock, May 31st.—	1911. Bags.	Value Fcs.	1910. Bags.	Value Fcs.
Pará	14,408	67·50 to 71	17,849	66 to 70
Bahia	37,930	60 ,, 68	22,164	62 ,, 67
Venezuela ...	41,459	71 ,, 160	52,101	70 ,, 150
Trinidad ...	50,070	66 ,, 69	42,250	66 ,, 70
Grenada and other W.I. ...	5,991	59 ,, 67	7,137	59 ,, 66
San Thomé ...	27,265	65 ,, 66·50	15,954	60 ,, 65
San Domingo ...	4,961	53 ,, 62	10,799	56 ,, 60
Haiti	16,565	51 ,, 64	19,523	49 ,, 62
Accra	58,794	58 ,, 62	19,672	57 ,, 60
Guayaquil ...	15,168	68 ,, 80	5,832	76 ,, 84
Others	27,615		27,393	
Totals ...	300,226		240,674	

London Stock, June 10th—	1911. Bags.	1910. Bags.
Trinidads	6,436	9,565
Grenadas	18,218	15,225
Other W.I.	6,689	5,188
British West Africa ..	7,185	5,563
Ceylon and Java	20,306	26,754
Guayaquil	41,704	17,002
Brazil and Bahia	1,312	1,471
German West Africa ..	7,268	685
St. Thomé	7,037	859
Other Foreign	12,069	10,250
Totals ..	128,224	92,562

Coming to the matter of present values, these run as follows, including the business transacted over the sale on June 20th:—

Trinidads.—Business has been mainly confined to fine marks, which sold at 58s. to 60s.; good mid. red at 57s. 6d.

Grenadas.—Fine marks are now selling up to 55s. 6d.; good fair to good, 52s. to 53s. 6d.; ordinary unfermented down to 49s.

Dominicas.—Ordinary to fair marks last sold at 48s. to 49s., whilst good marks are worth up to 53s.

St. Lucia.—Fine marks last sold up to 54s. 6d. are worth up to 52s. or 53s. 6d., whilst good marks sold at 51s., and fair fermented down to 51s.

Jamaica.—Fine sold up to 53s. 6d. and 54s.; good fair, 50s.; low to fair common, 45s. to 49s.

Surinam.—Good red sold at 55s.

Costa Rica.—Fair to good fair sold at 49s. to 51s. 6d.; good reddish, 52s. 6d. to 53s.

Panama.—Washed red of Ceylon character realized 55s. to 58s. 6d.

British West African are worth 46s. to 51s., and 251 bags sold at 51s., dull at 49s.

Cameroons.—The best sold up to 54s.

San Thomé.—Continue to go steadily into consumption, although no sales are reported. They are valued at 53s. to 55s.

Guayaquil.—Arriba has sold at 59s., but fine is worth about 62s.; Machala sold at 54s. to 55s.; good Caraquez, 54s. to 57s.; fine, 59s.; Esmeralda, 53s.; Tumaco, 51s. and 51s. 6d.

Ceylon.—Fine bold sells high at 85s. 6d.; fair to good medium boldish, 58s. to 70s.; native, 46s. to 51s., and 58s. 6d. for fine.

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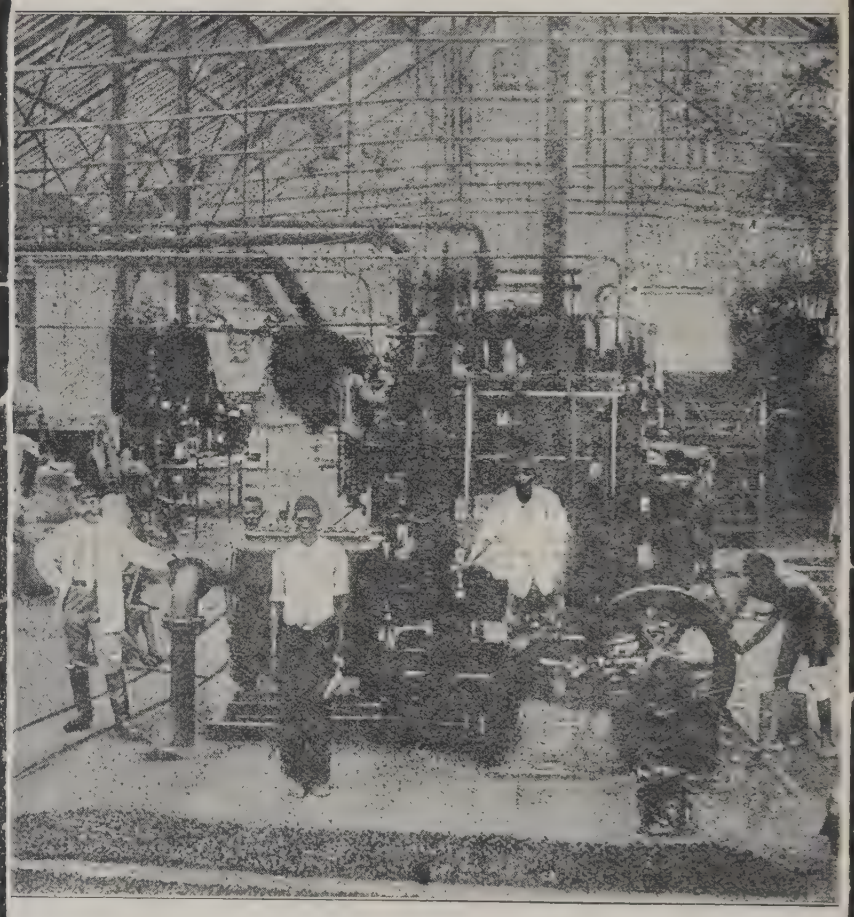

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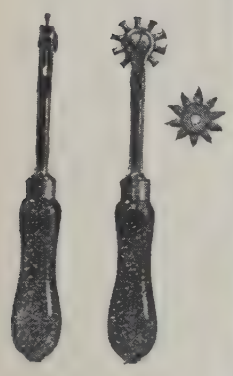

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The 1911 International Rubber Exhibition.

DINNER AND PRESENTATION TO MISS FULTON.

A Pleasing Function Marks the Close of the Exhibition and shows Appreciation of the Secretary's effort to make it a Success.

At the suggestion of Mr. E. G. Salmon, Editor of the *Rubber World*, many of the leading exhibitors, together with the rubber press, and those who had taken a leading part in the exhibition, arranged to present Miss Fulton, niece of Mr. Staines Manders, who had

Photo by] [*Kate Pragnell.*

MISS D. FULTON,
Secretary of the 1908 and 1911 Rubber Exhibitions.

acted as his Secretary, both for the 1908 and 1911 rubber Exhibitions, with a small token of their appreciation of the services she had rendered to them and to the exhibition generally, by the tact and patience she had invariably shown to everyone.

Accordingly, although all those who had subscribed were not able to attend, a goodly company met one

evening towards the close of the exhibition, at the Holborn Restaurant, and after partaking of an excellent dinner served by "mine host" of that well-known restaurant, Mr. Salmon, who presided, after the usual loyal toasts had been suitably honoured, rose, and in true "Salmonesque" style made a most appropriate speech in the course of which he proposed the health of Mr. Manders and Miss Fulton, asking the latter to accept a gold watch as a souvenir of the occasion and a mark of their esteem for all she had done for them. Speeches, short but to the point, were also made by Dr. Torrey, Mr. Grenier (of *Grenier's News*), the Editor of TROPICAL LIFE, Mr. Hunter, of the *Financier*, and others, after which both Mr. Manders and Miss Fulton replied.

AN OVERSEAS PRESS SOUVENIR OF THE CORONATION.

THE EMPIRE PRESS UNION'S BANQUET OF WELCOME TO THE NEWSPAPER PROPRIETORS, EDITORS, AND JOURNALISTS OF THE OVERSEAS' PRESS VISITING THE UNITED KINGDOM FOR THE CORONATION.

MANY distinguished newspaper proprietors and journalists being gathered together in London last month for the Coronation, they were entertained to a banquet at Prince's Restaurant by the Empire Press Union. The Rt. Hon. Lord Burnham, K.C.V.O. (Proprietor of the *Daily Telegraph*), in the chair, standing. Those seated on Lord Burnham's right hand (*i.e.*, as seen in the photo on his left) are Lord Curzon, Hon. John Murray (Premier of Victoria), Hon. Harry Lawson, M.P., and (lost in the shade) Mr. Crosbie Roles (*Times of Ceylon*). On the Chairman's left are Mr. Geoffrey Fairfax (*Sydney Morning Herald*), Lord Northcliffe (of *Daily Mail* fame), Hon. Arthur Sifton (Premier of Alberta), Sir Gilbert Parker, M.P., Mr. Kennedy Jones, Mr. T. P. O'Connor (with the serviette in position), and Sir Everard im Thurn (Governor of Fiji). At the bottom of the tables are (right to left) Mr. F. Miller (*Daily Telegraph*), Mr. Sidney Low, Mr. Le Sage (*Daily Telegraph*), Mr. Thomas Marlowe (*Daily Mail*), Mr. H. A. Gwynne (now editor of the *Morning Post*), and right on the edge, Mr. Acland (of the *Daily Graphic*).

The Editor of TROPICAL LIFE is at the second table from the right (see arrow), and on his left is Mr. Edwin L. Arnold, son of Sir Edwin Arnold, the poet, who at one time was closely connected with Lord Burnham in pushing the interests of the *Daily Telegraph*.

British West African Association.

THE above Association, founded by Mr. H. Osman Newland in October last, has so largely increased its membership that it is removing from 75A, Queen Victoria Street, to more commodious quarters on the first floor at 7 and 8, Poultry, London, E.C., where it will have reading and writing-rooms and a permanent place for its exhibits, which now are shown at the Coronation Exhibition, Shepherd's Bush. An entrance fee and increased subscription will shortly be imposed upon new entrants, but original members and the next 100 members proposed by them will only pay the original guinea a year subscription. Sir William Lever, Bart., the Association's Vice-president, entertains the members on Saturday, July 22nd, at his London residence, known as The Hill, Hampstead, when Sir Reginald Antrobus, the Crown Agent, Sir Walter Egerton, and other leading men in the colonial and tropical world will be present.

THE SECOND INTERNATIONAL RUBBER EXHIBITION HELD AT THE AGRICULTURAL HALL, LONDON, JUNE 24th to JULY 14th, 1911.

A Few General Remarks.

As is well known by now, the heaviest part of the arrangements for the Rubber Exhibition had to be completed at the height of the Coronation festivities, when half London was cut off by barriers, the entrances to many of the tube railways battened down, and every available carpenter engaged in erecting stands for the processions. Those having heavy machines to bring along, or stands to erect were therefore badly handicapped, management and exhibitors alike, in their efforts to be ready in time.

For all that, so far as appearances went, everything was complete when the Exhibition was opened to the public on Saturday, June 24th. Some of the large engineering firms were still awaiting a few more tons of machinery, but this was not noticeable, for it needed an expert to rearrange what had already arrived and make room for the new-comers.

Owing to the absence of the principals at the Naval Review, the formal opening was delayed until Monday, June 26th, when Lord Selborne, supported by Sir Henry Blake, the President, declared the Exhibition open before a distinguished assembly, including the leading men in the rubber world, Government officials, rubber directors, and overseas planters, as well as the chief exhibitors at the Show.

All Tropical Life's friends had important exhibits, as described elsewhere. Our stall was the very first on the right at the main entrance, so we were greeted by our friends both on entering and leaving, and there were very few of those connected with the Tropics who visited the Show that we did not know. H.R.H. Princess Louise of Schleswig-Holstein, the Portuguese Minister, M. Cambon the French Ambassador, Prince Henry of the Netherlands, the Prince de Linge of Belgium, the German Minister, and other distinguished visitors, honoured the Exhibition with their presence, and were received at the main entrance. Prince de Linge as he passed to go out noticed the photo of H.M. The King of the Belgians, included in our Brussels Exhibition Souvenir published in May, 1910, and accepted a copy of that issue, remarking as he did so—"Ah, a souvenir of the Exhibition; the likeness of our King is very good."

Photo by [*Kat Pragnell.*

Sir Henry Arthur Blake, G.C.M.G.

President of the Ceylon Rubber Exhibition, 1906; of the First International Rubber Exhibition, London, 1908, and of this the Second International Rubber Exhibition, 1911.

During the exhibition we did a brisk trade in our books, "Soil and Plant Sanitation," the "Future of Cacao-planting," &c., whilst the demand for our reprints on manuring rubber, and for Tropical Life itself surpassed all expectations. Next door but one to us, the stall of our contemporary, the *Rubber World*, did equally well with Dr. Cuthbert Christy's "The West African Rubber Industry." Mr. Salmon, the editor of the *Rubber World*, was in much demand at the pleasant little social functions sandwiched in with the more serious work his neat little speeches being quite a feature. Near to his stand was that of Messrs. J. H. de Bussy, the well-known publishers of Amsterdam. Here amidst Oriental drapery were supplies of their well-known weekly, *De Indische Mercuur*, Dr. Cramer's books on Hevea rubber, in English, French, and Dutch, and other publications of interest to the tropical agriculturist. Facing them at the entrance to the main hall was the capacious stand occupied by *The Times of Ceylon*, with a large photo of two well-known rubber veterans, Mr. H. A. Wickham, and one of *the* trees at Heneratgoda, Ceylon.

As we were writing these notes the genial director of the Paris *Le Caoutchouc et la Gutta Percha* was saying goodbye to M. Cambon, after having explained the chief points of interest in the exhibition to him. This well-known journal had an important exhibit in the French court. In the centre of the main hall was the comfortable stand of the *Gummi-Zeitung*, but although our old friends the *Journal d'Agriculture Tropicale* were down in the catalogue we regretted that no specimens of their useful publications were shown.

The American rubber press was fully represented. Mr. Henry C. Pearson, of the *India-rubber World*, was not present unfortunately, on account of ill-health, but Mr. Edward F. Pfaff did the honours in his absence, and we were very pleased to welcome him among us. *The India-rubber Review*, of Akron, had a stall the same as in 1908, with Mr.

Theodore E. Smith, its well-known editor, in charge; his journal we noticed had increased considerably in size since we saw it at the last exhibition. In the King George's Hall we found Mr. T. H. North, at the stall of *Industrial Notes and Queries*, sandwiched in between an unusually interesting exhibit of Ceará rubber by the Mkumbi and Manihot Companies, Ltd., on the one hand, and *Grenier's Rubber News* on the other. This stall was presided over by Mr. Charles Grenier in person, who told us that the demand for his Annual (1910) was still so strong that he had been obliged to print off another 2,000 copies, and was, whilst we spoke, evidently selling out these at a rapid rate.

In the main hall near the *Gummi-Zeitung* was

Photo by] [*Kate Pragnell.*

MR. A. STAINES MANDERS, J.P.
Organizing and Managing Director of the International Rubber Exhibitions of 1908 and 1911.

the large combined stand of the *Ceylon Observer* and the *India-rubber Journal* with well-known publications, and many books on rubber, &c., issued by them on sale. We beg to congratulate the *India-rubber Journal*, now a weekly, on the four numbers issued by them during the Exhibition. Those requiring fuller details of the Exhibition than we can give should write the *India-rubber Journal* for their Exhibition issues.

But where were the other leading papers in Malaya and the Far East? Why did they not have stalls as well, instead of being so far behind Ceylon in enterprise, especially after last year's rubber boom when they must, like the planters, have made plenty of money? Many of these papers had representatives over here for the Coronation, but in spite of this we looked in vain for the *Madras Mail* or the *Daily Post* of South India, the *Malay Mail*, *Pinang Gazette*, *Straits Times* or *Echo*, *Singapore Free Press* and many others, whom we should have liked to have seen represented.

Another year, perhaps, whether they take separate stalls or not, all the leading papers interested in rubber-producing centres, will collaborate and run a joint stall in the centre of the hall, and have their names painted up all round the front. Here in a common *rendez-vous* they could meet each other and their friends to chat, instead of having to go across the hall to do so. Meanwhile the joint stall would make a splendid advertisement for the Press.

So far as the rubber exhibition and its management was concerned, we can congratulate Mr. Staines Manders, and his executive Committee, not forgetting the

MR. ALEXANDER BETHUNE, J.P.
President of the Rubber Growers' Association.

secretary (Miss Fulton) on the completeness, and the success generally of the Exhibition, but we cannot congratulate the Agricultural Hall on its catering department, which is unsatisfactory in every way. We have at times had to take our meals in many out-of-the-way corners; but whilst drawbacks in such places were excusable, they should not be noticeable in a building that caters for the class of people who attend an international rubber exhibition.

With the next exhibition, we would suggest that it be closed at 8 p.m. instead of 10 p.m. as was the case with this. Every exhibitor would, we feel sure, welcome such a change and the useful public would not be kept away on that account. Those who support these exhibitions are hard-workers, and to knock off at 8 p.m. is late enough. Since therefore nothing worth recording in the way of business takes place after that hour we make the suggestion to the management to close the next exhibition two hours earlier.

THE BANQUET.

The Rubber-producing World acknowledges the Services of Mr. H. A. Wickham, and of Kew.

Whether it is true or not that exceptions prove the rule we are not going to argue, but the Rubber Banquet—which can well be described as a unique historical event—was the occasion of two episodes which are not nearly so common an occurrence as they might be; we refer to an acknowledgment by the public to an individual and to a Government department for services rendered for the public good.

On Friday, July 7th, at the close of the second week of the Rubber Exhibition, what has come to be described as one of the romances of economic botany was commemorated by a banquet at the Connaught Rooms, Kingsway, at which Sir Henry Blake, G.C.M.G., President of the Exhibition, occupied the chair, and was

Yours very faithfully
H. A. Wickham

Mr. H. A. Wickham, F.R.C.I.

supported by a large and influential gathering of men who are playing a leading part in the rubber and tropical world generally, among whom we noticed were Sir John Anderson, who has lately given up his post of Governor of Federated Malay States to become Permanent Under-Secretary of State for the Colonies, the Brazilian Minister (Don Regis de Oliveira), The Consuls-General for Brazil (Senhor Alves Vieira), Germany (Dr. Johannes), Holland (Mr. H. S. J. Maas), Belgium (M. E. Pollet), France (M. de Coppet), Russia (Baron A. Heyking). The Commissioners for the various Governments exhibiting were: Prof. Carmody, F.I.C., &c. (Trinidad), Sir William Taylor, K.C.M.G. (Malaya), Mr. Edward Rosling (Ceylon), Senor Emilio Larges (State of Amazonas), Dr. Jacques Huber (State of Pará), Dr. J. P. de Lacerda (U.S. of Brazil), Mr. F. A. Stockdale (British Guiana), Mr. W. S. D. Tudhope (Gold Coast), Mr. H. Powell (East African Protectorate), Mr. R. Fyffe (Uganda), &c., &c.

London was represented by Sir W. T. Thiselton-Dyer, K.C.M.G., Mr. Alexander Bethune (President of the Rubber Growers' Association), Mr. H. K. Rutherford (Past President), Mr. Norman Grieve, Mr. G. A. Talbot, Sir William Hood Treacher, K.C.M.G., and of course Mr. H. A. Wickham. Among the general company were Dr. Berkhout (Holland), Messrs. Robert Bridge, E. E. Buckleton, R. T. Cook, Stuart R. Cope, Oliphant and Charles Devitt, Walter and Cyril Smithett, Paulo Gerechter (Brazil), Chas. Grenier (of *Grenier's News*), Dr. Tromp de Haas, Messrs. J. C. Harvey (Mexico), W. Martin Leake (Secretary, Ceylon Association), Leon P. Osterrieth (Belgium), Kurt and Walter Pfleiderer, Dr. S. Rideal, Leslie Radclyffe, F. Crosbie Roles (*Times of Ceylon*), E. G. Salmon (*Rubber World*), Osman Shaw, Dr. A. J. N. Swart (Holland), Dr. Torry, Messrs. Herbert Wright, Fritz and John Zorn. Besides the long table with the principal guests, there were thirty-six other tables distributed over the room.

After the usual speeches, reference was made by the chairman to the way in which Mr. H. A. Wickham was enabled by Kew and the India Government to collect Hevea rubber seeds from the Tapajos plateau in the Amazonas Valley and bring them to Kew, under somewhat trying if romantic circumstances.* From the 7,000 plants raised from this shipment sprang the whole of the plantation rubber industry in Ceylon, Malaya and elsewhere. On account of this the rubber industries of the Middle East, the Rubber Growers' Association of London, the Planters' Associations of Ceylon and Malaya, and others, had arranged to present to Sir W. Thiselton Dyer, K.C.M.G., as representing Kew, of which he is an ex-Director, a silver salver, suitably inscribed as a memento of the occasion.

In a short but telling speech Mr. Norman Grieve asked Sir Henry Blake to make the presentation on behalf of the various bodies mentioned.

Mr. Alexander Bethune, as president of the Rubber Association, then spoke of the testimonial raised for Mr. Wickham as a result of which they were enabled to hand that veteran of the rubber world £1,000, and to invest a similar sum in purchasing an annuity for him. Thus was recognized the part played by those who had been instrumental in founding and establishing a vast industry that has brought prosperity and work, comfort and happiness to many in the tropics, and those dependent on the rubber industries at home. When the full history of the establishment of the rubber industry in the East comes to be written we believe it will also be found that the names of Mr. H. K. Rutherford and his friends figure largely among those who helped to establish the industry by means of the seeds obtained through Mr. Wickham's energy.

* See our sketch of Mr. Wickham as "Our Friend" in Tropical Life, March, 1909; also Mr. Wickham's own account in his book, "The Cultivation and Curing of Pará Rubber" (Tropical Life Publishing Department, 4s. post free), or in "The Coronation Souvenir of the 1911 Rubber Exhibition" (80 pages), issued by Messrs. David Bridge and Co., Ltd.

The 1911 Rubber Conference.

Our Editor placed second with his paper on "The Need of Organization in the Supply of Labour for Rubber and Other Estates."

THE Rubber Conference, held in connection with the 1908 Exhibition, was considered to have been a great success, and its value, as shown by the important book of the lectures, delivered in that year, was not overrated. With this, the 1911 Conference when the proceedings, combined reports of the 1908 and 1911 Conferences will offer to those interested in rubber planting a wonderfully complete digest of what those who have watched and studied the rise of the industry from every point of view during the whole period of its progress have to say on the matter.

Mr. Staines Manders, warned by the serious delay in the appearance of the 1908 report, a delay for which he was not responsible, has made special arrangements for the 1911 book to be published without delay. Those

Photo by Kate Pragnell.]

GROUP OF DELEGATES TO THE INTERNATIONAL RUBBER CONFERENCE, LONDON, JULY 3RD—11TH, 1911.

Front Row.—Sitting (left to right), Dr. Huber (Pará), Messrs. Aug. Chevalier (France), Staines Manders, F. Alves Vieira (Consul-General, Brazil), Dr. J. P. Lacerda (Brazil), Sir Henry Blake, G.C.M.G., &c., President, Dr. Tromp de Haas (Holland), Mr. Memmler, ——.

Second Row.— ——, ——, Mr. R. Fyffe (Uganda), M. Perrot (Madagascar), ——, ——, ——, J. A. Richardson (Southern India), Dr. Werner Esch (Germany), Mr. E. E. Buckleton (N. W. Rubber Company, Liverpool), ——, ——.

Third Row.—Dr. Stern, Mr. Cillard (*Le Caoutchouc*, Paris), M. Francois, Mr. Barry Band, ——, Editor of TROPICAL LIFE, ——, Mr. T. Petch (Ceylon), Mr. Herbert Wright, Mr. Pfaff (*India-rubber World*).

Back Row.—Mr. Martin (*Le Caoutchouc*), Professor de Wildemann (Brussels), Mr. Harry S. Smith (Tobago, inventor of the Centrifugal Coagulator), ——, Mr. H. Powell (East Africa), ——, Mr. Fol (Holland), ——, Mr. Schopper (Germany), ——, ——. Many delegates were absent.

in their turn, appear in book form,* our readers will probably notice that more assurance is shown as to results of planting or scientific work carried out in connection with rubber planting and preparation; whilst the general range of experience has been greatly extended in every way and on all sides. Taken together, the who do not hand in their papers at the close of the Conference at the latest (as a matter of fact, we believe they were all handed in after being read), or revise their proofs promptly, will have to remain outside the book, all agreeing that, regrettable as their absence will be, since half a new loaf is far better than very stale bread, it is preferable to get what we can at once than have to wait an indefinite number of months for the proceedings in full. As it is, however, we understand that no one will be left out, and no one will be kept waiting.

Printed page-proofs of many of the papers were on the table from the very start, including the paper read by Mr. Fyffe on "Rubber in Uganda," with which the

* A full report of the Conference, including the papers actually read, and the discussions and comments that followed, as well as those papers that were handed in, but could not be read for lack of time, will be published under the title of "The Rubber Industry," price 17s., post free, to any part of the world, or 15s. 6d. in London. Copies on application to "TROPICAL LIFE Publication Department." A few copies of the 1908 Conference book can still be obtained, price 12s. post free.

Conference opened; so that as soon as the discussions are added, and the whole revised, the various papers can be printed off at once. The same thing was done with the foreign delegates' papers, which were laid before those present, after being translated into English, all of which showed how determined the Conference Committee is to get the book out promptly at the close of the Conference.

Sir Henry Blake welcomed the delegates in one of those kindly speeches for which he is famous, and although all those who ultimately attended were not present at the opening, there was a very good attendance when the President made his opening speech. As can be seen by the photograph of the majority of the delegates, taken by Kate Pragnell, the well-known society photographer, all countries were represented—England, France, Holland, Belgium, Germany, America, &c. Although Italy was mentioned in the catalogue, their exhibit did not turn up, and we looked in vain at the Conference for Dr. Guido Mangano, whose acquaintance we made at the Brussels Congress last year.

Besides those included in the photograph, Professors Warburg and Preuss (Berlin), Berkhout (Holland), Voigt (Hamburg), Dr. Cuthbert Christy, and Mr. J. C. Harvey (Mexico), subsequently attended, and read papers or took part in the discussion.

We were unable to be present when all the papers were read, although we should very much liked to have been. For various reasons difficult to avoid (owing to pressure of work, our Editor, for instance, was unable to complete his paper until the day before the Conference opened), the names of the papers and those reading them were published only from day to day, so that it was often impossible to make arrangements on ahead. We were present, however, when Mr. Lierke, of the Potash Syndicate, read a paper on the "Manuring of Rubber Trees," and took part in the discussion that followed. When the book of the proceedings is published our readers will see for themselves what was said.

Among the papers read at the Conference were:—

Mr. R. Fyffe, on "Rubber in Uganda."

Editor of Tropical Life, "The Need of Organization in the Distribution of Literature and in Labour Supplies for the Tropics."

Dr. Carnegie Brown, on "Hygienic Conditions and Maintenance of Health in Rubber-planting Districts of the Tropics."

Dr. Jacques Huber (Director, Museu Goeldii Belem, Pará), on "Rubber Trees and Wild Rubber Reserves of the Amazon."

Herr Wilhelm Pahl, on "The Discovery of the Pará Reagent."

Mons. Aug. Chevalier, on "Rubber in French West Africa."

Dr. Lierke, Agricultural Chemist to the Potash Syndicate, on "Manuring Rubber Trees."

Professor de Wildéman, on "Rubber Trees and Vines of Africa."

Mr. H. A. Wickham, on "Pará Trees in the East."

Mr. Mitchell, on "Some Diseases of Hevea."

Dr. Tromp de Haas, on "Tapping Experiments in Java."

Dr. Clayton Beadle and Dr. Stevens, on "Raw Rubber Testing."

Dr. Heinrichsen, on "The Theory of Vulcanization."

Mr. J. Jacques, on "The Relative Value of Raw Rubbers."

Miss A. Borrowman, on "The Viscosity of Rubber."

Mons. André Cremazy, on "Rubber Plantations in Cochin China."

Mr. Kelway Bamber, on "The Growth and Production of Plantation Rubber."

When the book of the proceedings of the important Rubber Conference held in connection with the Rubber Exhibition is published, it will be seen that our Editor devoted the paper he contributed to the necessity of instant attention being given to the matter of organizing regular and reliable supplies of labour from centres which are over-populated, to those which are languishing for want of men on the estates. The paper went into details, and in its entirety was too long to read as a whole, and we have no room to more than mention it here. Such organization, contended the lecturer, is bound to benefit everyone: (1) The native; (2) the estate owner; (3) the centre the native comes from; (4) the centre he migrates to; (4) the trade of the Empire as a whole.

The daily and technical Press all speak of the importance of the matter, and express their pleasure at its being introduced so early in the proceedings. *The Times*, in their special Rubber Supplement, said: "One of the earliest subjects dealt with raised the important questions involved in the labour problem, and the need of organization was strongly urged by Mr. Harold Hamel Smith." In the course of their criticism on the paper and the situation generally, the *Financier* said: "The question of estate labour supplies in the Middle East was very properly brought, by Mr. Harold Hamel Smith (Editor of Tropical Life) before the attention of the Rubber Conference, which is in session this week at the International Rubber Exhibition at Islington. Mr. Hamel Smith's paper on this important subject rather stated a case than suggested remedies of a practical character for the solution of this admittedly great difficulty. Mr. Hamel Smith has had experience in handling workers of this description, but we very much question whether what might be described as the ultra-humanitarian view he tentatively put forward in the course of his paper will find very wide acceptance among European employers in the Middle East.* Some time in the dim and distant future, when the Indian coolie can be persuaded to take a view of existence in some way compatible with present economic ideas, the suggestion that he and his kind in their millions should be moved from districts where labour is superabundant, wages being therefore negligible and work for the multitude practically unobtainable, to districts where employment at rates representing at least a good living wage can be had, and where workers are in constant demand, may take place among the possibilities in the Middle East. By that time, too, the human

* We feel certain that when published in full the *Financier* will see that these remarks are due to a misunderstanding, Our Editor asks that those able to do so should be made to share in the work of the Empire. To do this needs a degree of firmness that some people who claim to be humanitarians object to. Since, however, this country is willing to help India to live peaceably and as prosperously as possible, the natives there must help, or the best endeavours on our part will fail.

machine, personated in this case by the coolie, may be speeded up so that a man's work for each day will warrant the payment to him of wages on a really attractive scale. Unfortunately those who are most competent to speak on this matter can hold out no hope of the advent of such a day."

My Ramble Round Raw Rubber.

(BY THE EDITOR.)

NATURALLY the first query that arises in the mind of anyone who has made a close study of the two rubber exhibitions—that of 1908 and the one under review—is "What difference is there in the make up of the rubber shown, and, if any, why has this difference arisen?"

At first sight I believe the man in the street would not notice much improvement in the various samples shown. There were the Ceylon and Malay Courts decorated with crêpe, sheet and block rubber of good quality and various colours exactly as in 1908, only the courts were much larger and had changed sides, Malay now being on the right, and Ceylon on your left, whereas three years ago it was the other way round. Malaya still proudly set forth a pile of the well-known Lanadron block, as clear, as strong, and as beautifully prepared as ever. Children said they looked like jujubes, and wished to use them as "chicle" is in America, whilst the most casually observant adult asked why were they so clear and clean, as compared with other rubbers (pointing to scrap crêpe) which looked stained and dirty.

As an habitué of Mincing Lane, I would maintain that taking the output of rubber in Ceylon and Malaya as a whole, the samples shown at the Agricultural Hall ran whiter or at least lighter than do the hundreds of samples one sees week in and week out on the brokers' counters down "the Lane" when the sales are on. Several visitors noticed the same thing. Perhaps this is accounted for by the natural anxiety of the estates to send their best and purest only to the show, whilst on the market everything that has a commercial value and pays to ship finds its way over, the dark indigenous rubbers from various centres as well as the scrap from our Eastern Colonies. Then again one experiments more with choice rubber, keeps the latex cleaner, or takes additional steps to check oxidation and discolouration, when putting up rubber for show, in order to see what the experts and buyers think of it. "Novelties" are made for shows, or rather perhaps shows are made to introduce novelties, and so for these reasons whilst agreeing that as a whole the Malayan and Ceylon rubbers, especially the latter, were perhaps lighter in colour than in 1908, I do not believe that taking the rubber sent over for sale as a whole much difference is to be noticed. Of course the latex nowadays is kept much cleaner from the start, and is prepared more rapidly and scientifically, hence a much larger proportion of best grades, *i.e.*, those without dirt to discolour the rubber, is turned out in comparison to dirty scrap.

Be all this as it may, everyone congratulated Ceylon, Malaya, and Southern India on their exhibits, whilst Trinidad and Tobago as well as Guiana and Dominica showed samples of strong smoked Hevea, and equally good Castilloa, or well-prepared Funtumia and Ceará, that made manufacturers realize that here were some fresh centres which promised great things if the planters persevered. The Castilloa samples of Mr. Harry S. Smith (of centrifugal fame), Caledonia Estate, Tobago, certainly compared well in strength and appearance with sheet Hevea.

CEYLON AND MALAYA COMPARED.

Going round these two exhibits, with stands of equal size, measuring, I believe, some 3,000 sq. ft. each, one naturally looks for points of resemblance, and also notes what differences, if any, exist between the two centres. Taken as a whole the Ceylon exhibit mainly consisted of pale "blanket," *i.e.*, of crêped rubber repassed through the machines and put up in this form, or else I understand taken off direct as thick crêpe. Some twist their crêpe into ropes and pass these ropes side by side between the rollers to be "blanketed" instead of laying them flat one on top of the other. Malaya, on the other hand, had a large proportion of dark and very dark sheeting passed through diamond rolls, not attractive in appearance compared to the pale thick crêpe or blanket, though of good quality in itself. In Ceylon were two samples of "shawl" rubber, *i.e.*, very pale short worms, which before being thoroughly dried are lightly pressed into sheet or block form, and so adhere into a coarse worsted shawl-like shape of a whitish colour. These came from Gikiyanakande Estate (belonging to Lord Elphinstone, and of which Mr. Golledge is manager), measuring about 18 × 24 in. by 1½ × 2 in. thick, and St. George Estate, Kalutara. The last was more block-shaped, half the size, but twice as thick as the first-named. Some of the blanket, I understand, was made from "shawl," as well as from crêpe, but such a form of preparation must be needlessly costly. Of course, all these forms are evolved in order to dry the rubber as thoroughly as possible. The disadvantage of sending over thin crêpe, or smooth sheets, as could be seen in many instances, is that they adhere so tightly that it is impossible, or almost so, to tear them apart. This detracts from the appearance of the bulk and also, even when the rubber is dry or free from resin, it gives one the passing fear that the stickiness may be due to either or both of these defects. Planters therefore use cut rollers, and some of them must have been deeply cut, diamond, spiral, straight cut, &c., in order to rib the surface of the sheeting, and by allowing some air to be there, prevent the sheets sticking together as they otherwise do.

There were, of course, several samples of crêpe on the Ceylon stall, as from Aloowiharie (Matale), Arapolakand (Kalutara), and Avisawella (Kelani Valley) Estates. Smoked and unsmoked sheet was shown by Rayigam, Kalutara, Pallekelle, Kandy, Clodagle, in Matale; pale sheet by Kondesalle, Kandy, Ganapalla, in Kelani Valley; and biscuits by Pallekelle, Kandy, and Dehiowita Estates, in the Kelani Valley.

Those estates showing blanket included Warriapolla, Matale, Ceylon Rubber Research Co., from Sunnycroft, Kiriporiwa, and Grand Central Co., all of Kelani Valley. Gikiyanakande (dark and light blanket), and

St. George (dark and light), both in Kalutara, Bandarapola, Matale, and Heatherley, Pallegoda, Hattangalla, Ellahande, Culloden, and Halwatura, all of Kalutara, Hapugasteune, Ratuapura, and Pelmadulla Estate, at Pelmadulla. Then I crossed over and came to the

Malaya Court.

Here I found some seventy large samples of commercial rubbers, which can roughly be divided into 5 samples of block rubbers, 23 of sheet, 27 crêpe, and 17 blanket, although catalogued crêpe. I mention this to show how crêping and blanketing are placed together by some estates, but blanketing is coarse and thick, and the sheets therefore do not stick together if the rubber is properly dried and free from tackiness, as when crêped or sheeted. These details, both as regards Ceylon and Malaya, give some idea as to how these important centres turn out their crops. Whether they will continue to do so, remains to be seen. I would strongly advise them to standardize their united output much more than is done at present; in fact, up to now there has been apparently no standardization at all. Rubber manufacturers, the same as cacao and chocolate manufacturers, must have their raw material supplied to "standard" or "type." The rough notes given here of these two leading centres show that so far little or nothing has been done in this line, but it is a mistake, and having now seen for themselves what an "*olla podrida*" they turn out (of excellent quality, no doubt), perhaps when the next exhibition comes along, say, in 1914, we shall see Malaya, Ceylon, and Brazil all similarly represented with two or three ten-ton heaps scattered around, like the Lanadron blocks, or Brazilian "pelles," which were again a conspicuous feature in this 1911 show.

No cacao manufacturer, who puts out a standard article on the market for the public to buy, would think of changing his make-up. If it is composed of one part Trinidad, two parts West Coast, and one Guayaquil, so it will remain (if the maker wishes to keep his customers) for all time. Guayaquils may go up to double the price of another growth, but that does not matter, they must be bought and the market price paid all the same. In 1906-1907, when cacaos, usually worth from 40s. to 110s., were all selling at 120s., makers passed over choice marks worth, as a rule, 110s., and insisted upon having 40s. or 50s. stuff at 120s., simply because their standard cacaos had to be made unaltered, whatever the cost. So will it be with rubber tyres and other goods. Nay, rather so it is already, but Brazilian "pelles" are used, because all know what the manufactured article from that kind can do. So it must be with plantation rubber, this must be standardized, and capable of being delivered regularly (when the output is 20,000 to 30,000 tons), 2,000 to 3,000 tons a month, of a uniform quality, the same as Brazilian. Until this is done "standard" goods cannot be made from it, for if the raw material is not "to standard," how can the manufactured article be?

But I am wandering. I did not set out to preach to my betters, but to mind my own business, so let me return and sum up what I saw in the Malay exhibit. Crêpe rubber, as sent from Selangor, was shown by Vallambrosa Co., Wardreburn Estate, West Country, Highlands and Lowlands, Batu Caves, Golden Hope, Petaling, Bukit Rajah, Seafield, Harpenden, Jugra, and Shelford Estates. Perak crêpe came from Gedong, Jebong, Cecily, and Chersonese Estates. Negri Sembilan was represented by Seremban and Linggi Estates. All those showed crêpe, whilst diamond-rolled sheets, among which dark, and very dark predominated, was shown by Krubong Co., Malacca, Pandau, Johore, Sugei, Krian, Perak, Shelford, Selangor, Chersonese, Perak, Bulub Rajah, Klang, and Vallambrosa, Linggi, Negri Sembilan, Sungei Kapar, and Pendameron Estates, Selangor.

For light sheets, I commend that shown by the Glenealy Rubber Estate, Perak, and I understand it stood the tests to show that it was an excellent rubber. Pale sheets were also shown by the Klabang Co., Serendah, Majedie, Chemor United, and Perhentean Estates. Blocks came from Lanadron, in the well-known cube shape, about 12 × 12 × 12 in., those by Vallambrosa being about 8 × 8 × 2 in., and Sungei Kapar also thin block. I was much interested in Linggi blocks, 6 × 6 × 2½ in., which had been coagulated by the Da Costa process of smoke and steam. The results seem quite satisfactory.

The German Section.

Coming to this section, although the rubber shown was, to me, somewhat disappointing, German Africa can, and does, produce good rubber; but judged by the samples submitted to the Exhibition, she shows lack of knowledge as how to prepare it. Here and there a sample stood out conspicuously among the rest, to show in a marked degree what can be done with the rubber. The sample numbered 30 (p. 331 of catalogue), was a striking example of pale, washed, and crêped Castilloa latex. This sample was labelled as coming from a seven-year-old tree, and so closely resembled Hevea (as shown in sample No. 33), that I still feel doubtful if it was not so. All I can say is that if German East Africa can do this with Castilloa, other centres need not despair of turning out attractive rubber.

What greatly interested me in the German rubbers was the large number of different kinds of vine and other wild rubbers shown that had been prepared by machinery. The results certainly were not satisfactory in many cases, but this could be remedied and was not the fault of the machines. *L. Kirkii*, from a vine 6½ years old, was pale crêpe, of good colour, but far too thin, just like a veil, and consequently very weak in texture. If such rubber, and the many other samples shown, must be rolled out so very thin for drying, or other reasons, we would suggest that six or more of these thin crêpe sheets be afterwards repassed through the machines and blanketted. A sheet of crêped *L. Stolzii*, about the size of a large Hevea leaf, had apparently evaporated, or been pulled off, but as a treacly outline remained, the idea was that it was so resinous that it had dispersed somehow or other in the air. This sample was No. 40, from a vine the same age as the *Kirkii* (6½ years). No. 46, described in the catalogue as *Tabernæmontana holstii*, but on the label as *L. holstii*, looked like a thin slab

of Castille soap in colour and texture. It had evidently been through a crêping machine, but was no use as a rubber, for though fairly thick for crêpe, you could tear off pieces with ease. Sample 44, described both in the catalogue and on the label as *L. Holstii*, coagulated, like No. 46, by heat, and although more like rubber in appearance, was short, tacky, and no use. No. 45, *L. florida*, coagulated by heat, was very short and brittle, breaking easily. This was not crêped, but in pieces, looking like broken-up Balata sheeting.

No. 41, *F. Vogelii*, crêpe, broke easily. No. 42, *F. Schlechteri*, crêped, was no good, being tacky and without strength. No. 39, *Clitandra kilimanjarica*, was dark crêpe, and tore easily; so did No. 37, *L. Heudelotii*. Sample 32 resembled overdone greengage jam, dried but sticky; it was marked Castilloa sp. No. 16 was two round biscuits, 4 or 5 in. in diameter, of *M. dichotoma*. The rubber looked very good, the biscuits being fairly clear, and the rubber "nervy." The thicker of the two biscuits was a little tacky on the edge. No. 35, *Mascarenhasia elastica*, was from trees 6½ years old, put up as dark crêpe, resembling Hevea, and fairly strong. No. 36 was rather paler, of the same variety, and perhaps slightly stronger. It is described as having been treated by oxalic acid. Sample 34, Hevea crêpe, seemed of good quality, which was more than could be said of some *C. elastica* biscuit, No. 29. Judging from the samples generally of Landolphias and Funtumias from German East Africa, these do not show up well in very thin crêpe form, taking the samples at the Exhibition as a whole, or else the rubber latex was poor, and the methods employed to get the almost gossamer thinness of the samples far too severe. *M. piauhiensis*, *M. dichotoma*, or the other kinds mentioned, were all the same, weak and poor, tearing almost like paper; whilst the earlier *numbers*, 11 and on, of *M. Glaziovii*, were the best, and could, with suitable machines, turn out excellent rubber, especially, perhaps, if, as already suggested, these thin sheets, turned out no doubt to facilitate drying, were afterwards repassed through the rollers, 6, 8, or 10 deep, and finally turned out in blanket form. The quality is there all right, as it is in many people, but needs to be encouraged and brought out. Thinking of this, I went across into King George's Hall, to see the exhibits of the Mkumbi and Manihot Companies, both in German East Africa. Here was found excellent rubber, great and small blocks of it, also crêped, and ball. The bulk of these exhibits had been prepared by hand before the "Bridge" machines now in use had arrived, but none of the samples were as small and as poor as those shown in the German raw rubber section. The Mkumbi stall also had a very trim tree in a tub at the entrance still going strong, with vigorous young shoots at the crown, and so full of milk that the public delighted to prick it with a pin in order to see the drops of milk jump out, until a hard-hearted attendant attached a notice forbidding such liberties; all the same sly pricks were got home, and the last I saw of the tree it was still responding to the wishes of the visitors to see real latex from a real rubber tree.

THE DUTCH EXHIBIT.

This was undoubtedly the most picturesque stand in the Exhibition, being housed in a Javanese Durbar House, painted mainly in red, picked out with green, and green flooring, with courtyards, galleries, &c., the whole decorated with Javanese images and figures in bronze, plaster, &c., as picturesque as they were interesting and instructive.

Taking the rubber exhibits, No. 17 and on, from Surinam, these showed Pará rubber sheeted and blocked, of clear colour, and excellent texture. Their other exhibits were of equally good quality and colour, but of the ordinary thin sheet and biscuit type. Some biscuits of Kickxia or Funtumia were of good quality, but needed better preparation.

Large, thick biscuits of *Hevea guayanensis* resembled black Castilloa in appearance, and were so weak that, thick as the biscuits were, they could be torn in two by hand, showing a white centre. In this section, Dr. A. W. Drost, who worked with Dr. Van Hall on curing the Witch Broom in the cacao lands, contributed a useful book on "Pará Rubber Culture in Surinam." Some balls of strip *Castilloa elastica* were of good quality, no doubt, but roughly prepared. The Sumatra sheet and crêped Hevea from the Sennah Rubber Estates were well prepared. Messrs. Weise & Co., the well-known rubber importers, of Rotterdam, showed a carefully assorted set of African rubbers, including Soudan lump, Kasai pieces, Upper Congo, Conakry, and other kinds, as well as block and crêped root rubbers. Their block rubber, prepared from Jelutong, dark in appearance, tore easily in crêpe form, although, as block, it looked well enough. The Ficus balls looked well. Whilst on the matter of crêped Jelutong, *i.e.*, Jelutong with 20 per cent. of resin extracted, we noticed that on the stall of the United Malaysian Rubber Co., Ltd. (Pinner's Hall, Austin Friars, E.C.), the rubber prepared from Jelutong, together with the usual mixtures, but without any other rubber or gum added, made up into what was apparently very serviceable inner tubes, solid tyres, hose tubing, solid tubing, mats, &c. This being so, the use of Jelutong in the manufacturing world may be heard more of in the near future.

Coming to the Java exhibits, No. 122, 60 kilos of Pará sheet from "Pasir Ajoenan" Estate, attracted my attention for quality and appearance. This was from four-year-old trees, prepared with fluoric hydrogen in wooden coagulation tubs, rolled in a hand mangle, and slightly smoked, harvested in January, tapped on half-herring-bone, by incisions 16 to 18 cm. apart. Next to this stood some blanketed Ceará, strong, clear amber colour, much resembling Pará, and of excellent quality. Exhibit 17, Ficus crêpe was of good colour, and though it was easy to tear, would be of use to manufacturers; it was prepared without the use of chemicals. The hand-made blocks, next to it, showed up better for strength, colour, and texture, and with No. 15 appealed to me as being a more attractive rubber for market. No. 15 was darker than 16. Exhibit 14, of so-called Pamanockan balls, from Ficus, each weighing 4 kilos., and looking like a lot of choice onions, attracted the public as a curiosity. They seem good for a Ficus rubber, and were prepared without chemicals.

Stall 70, of the Anglo-Dutch Plantations (an English company), caused one of the leading Dutch Com-

missioners to lament that a Dutch management could not lay claim to it. The rubber shown, Hevea sheet, Ficus ball, Castilloa scrap, was certainly very good and showed care in preparation. The company also showed tea, rice, coffee, &c. The paddy rice being much noticed, as everyone knows rice, but does not see it in "the ear." The Association of Leaseholders in Djocja and Solo showed good Hevea and Ficus crêpe, although dark in colour; whilst next to them the samples of Malang soil were of great interest. Of the Rubber Planters' Association, at Bandoeng (West Java), their exhibit of sheet, No. 37, coagulated with acetic acid, from a 3½-year-old tree, seemed very good; whilst No. 33, from a six-year-old tree, was an attractive lot. The Ned. Rubber Cultuur Maatij., of Amsterdam (No. 22), had a large exhibit of good quality crêpe rubber, and so did the Ned. Rubber Co. (No. 23), and the Langsar Sumatra Co. (No. 28), who also showed smoked sheet. The United Serdang showed blocked crêpe scrap, that is perhaps a change for the better on crêpe sheet; whilst their smoked blanket crêpe, with its corrugated surface, as if pressed between galvanized sheets, I had already met down "The Lane" when up for sale. The Sealang Rubber Co.'s smoked sheets were very strong in texture.

Southern India

Had a good show, as they promised to have, and showed much care in the setting out and arrangement. Everything was plainly seen without being too loosely arranged. The ground covered must have been at least 1,000 sq. ft. The exhibits started with four samples of Ceará sheet from Maryland Estate, dark sheet, medium and light, all equally good. The Coorg Estates Co., Ltd., confined themselves to one lot of thin, dark, but strong sheet. The oblong Pará biscuits of Mundehayam Estate, from trees 4½ years old, showed that S. India can hold its own for good amber sheeting, and this was confirmed so far as colour went, by the Rani Travancore Co.'s, Ltd., white Pará, a crêpe of pale amber colour, but rather weak in texture, maybe the trees were young. The Yendayar sheet, as well as that of the Stagbrook Rubber Estates, Travancore, was of good, strong texture, making two more estates capable of turning out excellent rubber. The Mooply Valley Rubber Co. were evidently proud of their sheets, hand rolled from 4½-year trees, since they showed them in a flat wooden box, similar to a salver case, and certainly the rubber was of fine quality, being exhibited in four attractive amber oblong biscuits. Utollalu Estate showed Ceará biscuits in dark and amber colour, next to some strong amber sheet of the Travancore Rubber Co., Ltd. Scrap crêpe was shown by Yendayar Estate, Travancore Rubber Co. and Orkaden Rubber Co., Ltd. Needless to say, tea and coffee were not forgotten to assort an all-round excellent exhibit, that should go a long way to attract capital to S. India; but we have not time or space to report on those. I am sure everyone present congratulated this Colony on its fine stand, and trust that its enterprising planters will reap much benefit from it. It is generally considered that they will.

Uganda.

Ceará rubber was introduced here in 1902, Pará and Castilloa 1901, when one of each tree was planted; whilst in 1908 seeds of the *M. dichotoma* and *M. piauhiensis* were introduced. The Ceará seems to have done well, as we are told that trees about three years old have yielded an average of 1 lb. 6 oz. of dry rubber a tree, and that 19 oz. were obtained (in 2½ months) from eight-year-old trees. The cultivation of Castilloa has not been recommended, as it was found that the trees were liable to pests, but the Ceará seems to be quite satisfactory, more so than the *dichotoma* and *piauhiensis*. The Pará, on the whole, seems to have given satisfaction, the original tree having attained a girth of 35 in. at eight years old, and yielded 16½ oz. of dry rubber in 107 tappings, whilst some 4½ trees measured 18 in. in girth, and experimental tapping produced 15½ oz. from one tree in 107 tappings.

The samples shown, all prepared under Government supervision, showed that the quality can be all right when prepared with care. There were four samples of Hevea, in crêpe, biscuit, and scrap form; four of Ceará, in crêpe, biscuit, and scrap; two samples of *Funtumia elastica*, in crêpe form, and one in biscuit; whilst two vine rubbers completed a very full and quite a large assortment, viz., crêpe, sheet, and biscuit *L. Daweii*, sheet, biscuits, crêpe, and balls from *Clitandra orientalis*, with its characteristic greyish colour. A good-sized portion of a vine of *L. florida* received much attention.

Gold Coast.

The rubber shown on this stand included samples of rubber from *F. elastica*, *Hevea*, *L. Owariensis*, *F. Vogelii* *M. Glaziovii*, &c.

Of the Hevea exhibits, good qualities were contributed by the Suku Suku Estates of Axim, belonging to the African Rubber Co., which sent dark biscuit and scrap ball. *F. elastica* in biscuit was shown by the Aguna Rubber and Trading Co. Ltd., who also showed *F. Vogelii* in biscuit form, whilst the experimental station at Tarquah sent in a large quantity (we believe half-a-ton in all) of dark smoked biscuit from 5½-year-old Hevea tree, some biscuit prepared with purub, some from washed rubber, as well as some made without the addition of any coagulant, only steeped for a few minutes in boiling water, these in turn could be compared with a very similar biscuit coagulated with acetic acid, or again without either coagulant or boiling water.

Other exhibits included *F. Vogelii*, weak in texture, two tough thin amber biscuits of *M. dichotoma*, a good assortment of vine rubbers, ball, and biscuit Ceará, the whole forming a very comprehensive exhibit. The Funtumia strip ball, and some very good amber biscuit prepared by boiling on the "double pot" system (the same as when making glue), showed up well against some rather unattractive Funtumia shown elsewhere.

Mexican Castilloa.

Two of the leading Castilloa estates in Mexico were represented at the exhibition—viz., La Zacualpa and Soconuisco. What is more, the rubber stumps shown yielded milk when tapped in considerable quantities up to the last; on this account the stall attracted large

numbers of the public whenever public tapping demonstrations were given, and this was fairly often.

The rubber exhibited was mostly in block, the general method employed being to coagulate the latex in wooden tanks, pass the rubber between rollers, and sheet it, the sheets then being blocked. Samples were shown of vacuum-dried block, and a great feature among the exhibits was a cone of centrifugally coagulated rubber from Zacualpa prepared in an Empire separator, particulars of which were given in TROPICAL LIFE of August, 1910, p. 148. We preferred, however, the sheet sample of good amber colour out of the "Smith" centrifugal, prepared from latex, be it remembered, that had come across Mexico and the sea, and chemically treated to prevent coagulation. The Empire cone comes out quite solid, and has to be cut crossways into strips, looking strangely like rashers of bacon, for drying. Some sheet Castilloa prepared on the estate by the manager was of a more attractive colour than the block rubber, and showed together with the "Smith" biscuit, and the pale sample in the German exhibit (mentioned elsewhere) that Castilloa, even in Mexico, can be turned out in all colours "to order." Crêped Castilloa, both sheet and blocked, was also shown, so that all forms were thus included in the exhibition the same as with Hevea; and showed that, given the advantage of scientific preparation, Castilloa can be made a more worthy competitor of Pará both in appearance and intrinsic value than has hitherto been the rule.

THE WEST INDIES.

Under this heading I include Trinidad and Tobago, a joint exhibit, British Guiana, Dominica, and Jamaica. Trinidad showed some excellent rubber. Sir Henry Blake, in his parting speech when awarding the prizes, said the West Indies would have to be reckoned with in the future as a producer. The samples shown proved such a statement to be correct. It is difficult with my limited space to fairly describe the exhibits. I can only say that in Trinidad I found seventeen samples of Hevea, most of which I have marked as "good," and I was particularly pleased with the Castilloa samples, both as regards colour and strength. Most of the Funtumia and Ceará samples were of good quality, Ste. Marie Estate showing good clean ball Funtumia (No. 41B), and the Department of Agriculture some good clean Ceará (No. 28). The Tobago samples were "great" considering the resources of the island. This small centre tends to rival Ceylon as regards the fame of its planters and produce, the presence of Mr. Harry S. Smith and his centrifugal separator being a crowning point. The island showed twenty samples in all, and I have not put a bad mark against any of them.

On the British Guiana stall Noitgedacht Estate showed some good biscuits, both air-dried and smoked. The experiment station at Ondermeeing also sent good biscuit rubber, the David Young Estates Company, and the Demerara Company, Ltd., both contributed some nice samples of Sapium and Hevea. Other notable exhibits were the Balata trunks, showing the methods of tapping, and some sheet Balata.

From Dominica came good strong white biscuit, from Governor Estate, also some good but dark Funtumia. This rubber (*F. elastica*) from trees planted along the Imperial (Government) Road, was also shown, as well as from Point Mulatre and Concord estates. Jamaica sent a very poor show both as regards quality and quantity.

Want of space causes us to postpone a fuller report of the exhibits until our August issue, especially those shown in the Brazilian and Belgian courts. A sample of Tirualli was shown on the British East African stand, which looked like dried-up jelutong; it certainly did not confirm all one had heard of it as a producer of rubber. As full particulars of the trophy awards are not yet to hand, we will also keep that report until next month, only stating that the *India-Rubber World* trophy awards (for the best method of tapping Castilloa) was very properly withdrawn, as no method deserving of so valuable a prize was forthcoming. The silver-gilt trophy from Belgium went to Holland, and the President's trophy to Germany. The *India-rubber Journal's* shield, and Messrs. Grenier's trophy have not yet been awarded.

Reviews.

A WEALTH OF RUBBER LITERATURE.

THE PHYSIOLOGY AND DISEASES OF HEVEA BRASILIENSIS. By T. Petch, B.Sc., B.A., Mycologist to the Government of Ceylon. 268 pp., including 4 pp. index, one coloured plate and fifteen photographic blocks. Price 7s. 6d. net or 8s. 6d. post free. Dulau and Co., Ltd., 37, Soho Square, London. W.

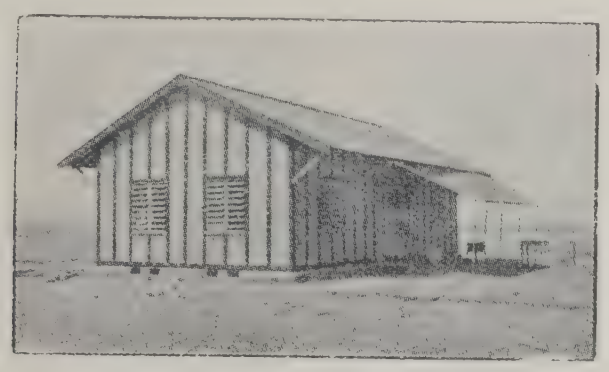
This book, appearing as it did in the midst of the preparation for the 1911 Rubber Conference, came at a very opportune moment. It is an extremely useful book, we had it with us up at the Exhibition, where many people interested in rubber expressed their pleasure that they could place such a book on their shelves. Divided into fourteen chapters, the work fully justifies its title as can be seen by the headings: (1) The Structure of Hevea; (2) (Latex and Rubber; (3) The Strength of Plantation Rubber; (4) Physiological Considerations; (5) Tapping Methods and their Effects on the Trees; (6) Tapping Experiments and their Teachings; (7) The Art of Experiment; (8) General Sanitation; (9) Leaf Diseases; (10) Root Diseases; (11) Stem Diseases; (12) Abnormalities in Hevea; (13) Prepared Rubber, and Fungi affecting it; (14) Other Fungi of Hevea.

We are pleased to see that Mr. Petch urges the removal of stumps, and pp. 146 to 151 should be carefully studied by those clearing fresh lands. Then follows the matter of planting distances. This came up at the Conference, but as those interested in "company-worked" estates were most prominent in the debate, needless to say they favoured close planting. With this we were unable to agree, neither was Mr. H. A. Wickham, who read one of the papers, on which such a discussion arose. In our opinion, rubber, cacao and coco-nuts should be planted at such distances as will allow the tree to fully develop, without its branches overlapping and rubbing against each other. A certain amount of pruning may be brought into play to tidy up the trees, but even then the distances must be much wider than those advocated by

(*Reviews continued on p.* 137.)

Buildings for Rubber Estates.

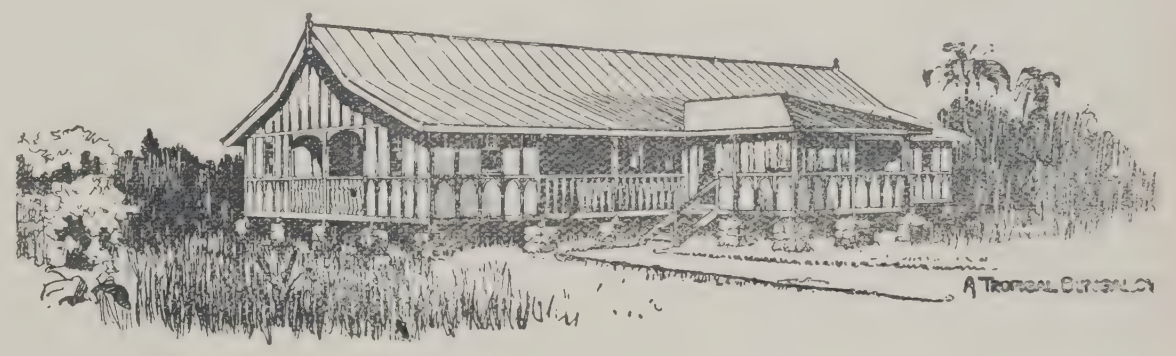
THE need in the Tropics for a class of building material for wall and roof covering, which will be proof against the intense heat, and at the same time immune from the rotting effects of damp and the attacks of insects, particularly white ants, is supplied in the worst climates by the material known under the name of wire-wove roofing. It is a combination of water-proofed papier-maché, with a steel wire gauze foundation embedded, and is supplied in sheets painted and sanded ready for use. These sheets are of artistic appearance, and owing to the great tensile strength which the steel wire gives, they remain perfectly flat in use between the rafters or wall framing, and therefore do not require the added expense of boards underneath. They are scarcely more than half the weight of twenty-four gauge galvanized corrugated sheets, which is a great advantage for transport, especially up country, while near the sea they are far more durable than galvanized iron, being entirely unaffected by salt spray, steam or other vapours which frequently corrode the latter very quickly. Most important of all, wire-wove roofing is composed of one of the best known non-conductors of heat and cold, *i.e.*, papier-maché.



Tropical Bungalow—Soudan.

This wire-wove roofing has been very largely used during the last twenty-four years all over Africa, especially round the Gulf of Guinea, where the climate is hot and damp; also in Central and South America, and in practically every tropical country the world over. We are informed that one firm ordered twenty years ago for one market 20,000 square metres of this roofing, and for the same market we have seen two recent orders for 47,000 and for 18,000 square metres respectively, which is more than 16 acres.

The Wire-wove Roofing Company makes a speciality of the design and construction of buildings for extreme climates. The heads of the firm have actual personal knowledge of the Tropics and tropical life, which ensures intelligent provision in buildings of their design for all those details which make the difference between comfort in an even temperature—and consequently health—and the purgatory which results from inhabiting the diminutive ovens sometimes supplied by inexperienced builders. Our illustrations show three favourite styles of buildings supplied.



Tropical Bungalow—Central Africa.

Tropical Bungalow—Far East.

THE census taken on the night of March 10th of the population of Ceylon showed the total population of that island, including the military and shipping population, to be 4,096,021 souls, an increase of nearly 15 per cent. since 1901. The estate population had increased 14.48 per cent., from 441,601 souls in 1901 to 505,554 this year.

WHAT our American advertisers say of us. The B. G Pratt Co., makers of the well-known San José scale exterminator, "Scalecide," write us: "I have your favor of May 25; also the copies of TROPICAL LIFE of the same month. I want to congratulate you on the handsome appearance which your magazine is making, and the increased advertising it shows."

THE following shows how TROPICAL LIFE travels:—

"Port Moresby, Papua.

"I enclose P.O. for 10s. for one year's subscription to TROPICAL LIFE. Strange to relate, I have been receiving copies from my brother in British East Africa. I should be pleased to hear of reliable books on tobacco planting."

"Tropical Life" Friend.—No. 73.

DR. W. R. TROMP DE HAAS.

Director of the Dutch Government's Gutta-percha Estates, Java, and Rubber Estates, Sumatra.

IT is almost like bringing coals to Newcastle to trouble about an introduction over "Our Friend" this month. Certainly, at the Rubber Exhibition, Dr. Tromp de Haas and Mr. Von Hemert were as well known almost as Mr. Manders himself, being in constant attendance whilst the Netherlands' court was being erected, as well as during the Exhibition, to answer any important queries that might be raised by those having a genuine interest in tropical agriculture generally, and Java in particular.

Dr. Tromp de Haas, like all of the many leading men whose scientific work in the Tropics is placing Holland in the forefront of tropical development, has had a thorough training and knows Ceylon, Bengal, and the Malay States well. About 1890, when we were studying cacao and sugar planting in the West Indies, "Our Friend" was studying agriculture at Wageningen, so far as that centre was then able to teach him. (To-day the Wageningen course of studies takes one to a much higher level than it was possible to obtain twenty years ago). From Wageningen Dr. Tromp de Haas went to Göttingen, in Germany, to study chemistry and agriculture more thoroughly. Having done so to his satisfaction, "Our Friend" went back to Wageningen and remained there for a year and a half as assistant, after which he left for Java, having been appointed to the Buitenzorg Gardens there. At that time (the same as in our own Colony of Trinidad) the department was known simply as the Botanical Gardens, but now as the Agricultural Department, and has attained a popularity and name second only to Ceylon. At Buitenzorg, Dr. Tromp de Haas worked under Professor von Romburgh, who had been stationed there since 1890, and on his leaving to go back to Utrecht, "Our Friend" took his place, becoming chief of the Agricultural Chemistry Department.

The work with which the name of Tromp de Haas has been most closely connected in our minds is that which he has done in connection with the gutta-percha estates, the property of the Government in Java, "Our Friend" being Director of the Government Gutta-percha Estates in Java, and the Government Rubber Estates in Sumatra. The demand for insulating material for submarine cables, caused greater attention to be given to those trees producing gutta-percha or similar material suitable for the purpose, and noticing that the trees producing these were confined to a limited area, viz., Borneo, Sumatra, and Malacca, steps were taken to preserve them. With this end in view small plantations were laid out in the Agricultural Garden at Buitenzorg, and later planting on a larger scale was carried out at Tjipeter. The results obtained there induced the Government in 1900 to establish a larger plantation, until about 2,500 acres in all have been planted, and are now under the entire charge of Dr. Tromp de Haas.

"Our Friend" of late has been experimenting in extracting gutta from the leaves by a mechanical process, and finally his efforts were crowned with complete success. Samples of the product extracted by this process were shown at the Exhibition and attracted much attention.

In conclusion we take this opportunity of thanking Dr. Tromp de Haas and his colleagues for their many little courtesies and attentions extended to us, and to wish them every success in their endeavours to open up the tropical possessions under their control, along right lines to the advantage of all concerned, owners, labourers, trees, and crops alike, to say nothing of those in Europe who will benefit from the resultant improvement in trade.

Among the gatherings held in connection with the Rubber Exhibition, we had the pleasure of attending the Dutch dinner and reception, which was held at the Hotel Metropole, on Wednesday, July 12th. Among those present were Mr. H. S. J. Maas (Consul-General for Holland), who presided; H. E. Gen. Von Hentz, (late Governor of the Dutch East Indies), Dr. Swart, Dr. Tromp de Haas, Professor Dr. Berkhout, Mons. Pollet (Consul-General for Belgium), Lt.-Col. Prain (Director at Kew), Messrs. Rosling, Richardson, Staines Manders, Musly, Aspinall, Herbert Wright, H. A. Wickham, Fol, Pfaff (*India-rubber World*), whilst Sir Henry Blake, Mr. Kelway Bamber, and Dr. Torrey wrote regretting their inability to attend. Those present unanimously voted the Dutch dinner to have been one of the pleasantest of many pleasant functions held in connection with and during the (1911) Rubber Exhibition.

Receptions were held at the Exhibition in the North Gallery by Mr. Rosling (of Ceylon), the Belgian section, the Malay section, the Ceylon section, and others, each forming, with the various dinners, social links that bound together the proceedings as a whole, and caused them to be as enjoyable as they were useful and instructive.

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All **literary communications** should be addressed **to the Editor,** and accompanied by the necessary stamps for their return if not accepted.

3.—All **business communications and payments**, either for subscriptions or advertisements, should be sent **to the Publishers** of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is **Ten Shillings** per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed to the Manager of the Department.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

JULY, 1911.

Labour Supplies for the Tropics.

THE paper on the above subject, read by our Editor before the Rubber Conference, called forth the following article in the columns of the *Financier*.

"It is not difficult to conjure up the probable effect of any scheme formulated for the purpose of moving masses of the population from quarters where work is scarce to quarters where work is plentiful, and letting it be known that such movements were not of a necessarily temporary, but of a permanent, character. Mr. Hamel Smith suggested in the course of his paper before the Conference that two millions of natives might be thus earmarked and moved from over-populated districts to others less adequately blessed with human labour-machines, in the interests of agricultural developments. To attempt such migrations, however, by compulsion would be to court failure and probably something worse than failure.

"At the same time the labour problem in Malaya must be solved, or at any rate the question involved must be brought to that stage which robs supplies of their existing precariousness. Voluntary emigration on the part of the South Indian Tamil to the Peninsula with the idea of permanent settlement in his mind would appear to offer the more satisfactory solution of this trouble. The Malayan as an estate labourer, working under the necessary restrictions imposed by European supervision, is by general consent among planters an impossible proposition. As a rule he is a decent fellow, but he declines to circumscribe his horizon by devoting his life and energies to field labour, even when the pay from his standpoint is adequate. The bent of his genius under efficient government has yet to be discovered, but he has already given ample proof that we are not to look for such a development in connection with European agricultural enterprises in the Peninsula. He has no objection to the alien undertaking such work, however; at least, he has not attempted, with the help of some local Redmond, to campaign politically in favour of Malaya for the Malayans. It is possible, though at present it seems hardly probable, that he may, as time goes on, adapt himself to the already changed conditions in the portion of the Peninsula of which we have a moderately accurate knowledge, and eventually supply a quota of the labour required on the plantations; but, whatever his intentions in the future in this connection may be, he offers no solution of the present difficulty. The fact that the Tamil labour supplies are based on the voluntary character of this immigration and the brevity of the term of service for which these immigrants can contract if they care to do so, accentuates in the minds of employers of such labour the further fact that these supplies are being obtained solely by the goodwill of the Indian Government. As circumstances go the chances are unfavourable to any movement on the part of that Government calculated to materially interfere with the Malayan planter's policy of turning to Southern India for his supply of such labour, and, provided it is possible to retain the permanent services of such immigrants in the Peninsula, settling them, in point of fact, in a country which experience has taught them offers them greater material advantages than their own, the whole problem of estate labour eventually would solve itself, provided it were possible to make this settlement policy sufficiently broad to adequately meet further developments in connection with agricultural enterprise. For the time must come when Southern India will insist upon an embargo being put upon the unlimited voluntary emigration of its labouring class, and, the circumstances considered, no one will blame the authorities if they take steps to protect the interests of planters within their own borders. While it is improbable that such an embargo will be laid upon this emigration from Southern India to Malaya in the near future, the fact that in the Peninsula the Tamil is better off by far than he would be if he contracted for a term of service in Ceylon, and that in Malaya greater opportunities are afforded him of becoming a permanent and well-to-do inhabitant than he can possibly expect in the neighbouring Crown Colony, cannot be overlooked. In other words, the Tamil, returning home after a term of service in Malaya, well satisfied with himself and the results of his exile, becomes a labour-recruiting agent of first-class importance, if at the same time he is liable to make his fellows discontented with their lot in their native land and determined, as opportunity serves, to try their fortunes elsewhere. An emigration movement among the agricultural population of India may be difficult for members of the governing race to initiate, but might be susceptible to over-great success when it originates with the peoples themselves. Possibilities such as these the Indian authorities cannot afford to overlook, and, despite the fact that, judged by the lowest of European standpoints, the supply of this labour is more than adequate for any demand which might be put upon it, judged from

the Indian standpoint, any considerable voluntary movement might make it absolutely inadequate in the very regions which naturally have the first call upon its services. It would be inadvisable, then, to assume that so far as Malaya is concerned the labour problem is bound, with the help of Tamil immigrants, to solve itself, and, even if such a solution were deemed probable, it could not be looked for in the immediate future."

"As it is to the immediate future the Malayan planters have to look, there appears to be a growing inclination to favour the employment of Chinese on the rubber estates. Hitherto this class of labour has been looked upon as too costly to be utilized in bulk. This objection, however, is one which could be speedily got rid of, and even if the cost per worker proved higher than the cost per Tamil, it is claimed that the Chinese labourer, on account of his greater adaptability, is in the long run the cheaper of the two. A speaker at the meeting of the Conference, when Mr. Hamel Smith raised the question of Middle East labour, very properly emphasized the fact that there are Chinese and Chinese labourers. The Chinese skilled labourer as a workman has scarcely an equal in the world, and his price is generally commensurate with his abilities. Compared with him, the Chinese field coolie is a creature of a lower plane altogether, but it is claimed for him that he possesses intelligence and, as a rule, energy, superior to that displayed by the average Indian field labourer, at any rate, of such as constitute the available supplies for Malayan plantations. These Chinese labourers do not appear to have the same objections to exile and work under alien conditions as we find among the Indian workers, or if they have, they take care, so long as the pay and the country are to their liking, to conceal them. Estate managers who have employed Chinese labour of this class as a rule consider them adequate workers, cleverer at learning their task than the average Tamils, and, if less docile, are certainly less pig-headed. The suggestion that the wholesale employment of Chinese coolie labour should be faced by the Malayan planters probably would be the signal for vehement protests against such a procedure in this country, and there would be always the possibility of a repetition of that campaign against the employment of Chinese in the Rand mines, which did more than anything else to wreck the British Government which consented to that way out of a South African labour difficulty. The fact that opponents of the employment of such labour on an extended scale in Malaya were wholly ignorant of local conditions and the problem the planters have to face and combat would count doubtless to such objectors for righteousness, and those who are prepared to undertake the advocacy of importing into the Peninsula platoons of Chinese for work on the plantations would do well, before they set out on their campaign, to consider what courtesy compels us to designate British prejudices in this matter. Exeter Hall on the rampage campaigning with numerous man-and-a-brother brigades may be guaranteed to deluge this country with records of Chinese degradation and filth, oblivious of the fact that the future satisfactory employment of some thirty millions sterling of British capital might be seriously menaced if such labour were compulsorily withheld.

"It really comes to this, then: that as things are at the moment, permanency in the matter of Malayan plantation labour supplies cannot be reasonably expected, so the most we must hope for is that the supply will be at least adequate. Under this limited aspect the problem to a very great extent is solved, and the future, assuming the permanent settlement of a percentage of the immigrant Tamils with their families, will present comparatively few terrors to the competent planter or estate manager. Such circumstances will entail the continual reference in directors' reports to scarcity of labour just at the periods when ample labour is most wanted; it will mean the continual training of fresh hands to the work they have to do, and it must mean the entire abrogation of any scheme planters may have dreamed of to speed up the human machines under their control, in the hope of obtaining better and more adequate results. Still, assuming the correctness of the settlement idea, these difficulties will decrease, or, at any rate, we are at liberty to presume they will decrease, as time goes on, and it is to be hoped that eventually Malaya will be free from a labour situation similar to that which Ceylon has still to face, and, so far as we can see, will continue to face for an indefinite period. In Ceylon the man who understands and can explain the labour position as it affects the plantations, so that it is intelligible to the average human being, calls for great kindness at the hands of the British investor. The system is one of the most beautiful examples of that policy of compromise which endeared itself to this nation some fifty years ago, and has been our constant bane throughout the ensuing years. As a matter of fact, the system is a patchwork of compromise and temporary expedients, which, so far as we can discover, when put into practice, gives unsatisfactory results to the majority of employers, and affords unlimited, or very nearly unlimited, opportunities to the employee to dodge his obligations to do a fair day's work for a fair day's pay. It is costly as well as inefficient, and we presume it will continue to be both until the end of time, since it has become apparently part and parcel of this section of life in the East. Scarcely a mail arrives from Colombo without bringing us newspapers containing columns of discussions at meetings of planters' associations throughout the planting provinces of the island on the labour system and the abuses to which it is open, and a member of any one of these associations only has to adventure a suggested reform which to the unprejudiced mind of the independent onlooker savours of common sense and at the same time to respect the better traditions, to have it shown by the majority of his fellows to be nonsense and calculated to stir up all the latent prejudices of the native labourer. The impression the outsider gathers from these discussions, which cannot all represent talking simply for talking's sake, is that there is work here for a sort of superman, who would tackle the job of arriving at an all-round solution which, if it failed to satisfy anyone at the moment (as it would naturally succeed in doing), would be eventually accepted as the best.

(*Reviews, continued from p.* 132.)

most of the "company" estates, otherwise the crops and the net revenue, when the estates are fifteen, twenty, twenty-five, or thirty years old, will pan out much less, taken as a whole, if close planted, than if more room per tree is allowed. In order to show a quicker and better return for the first ten years, the permanent prosperity of the estate is threatened, and this in our opinion is a thoroughly bad policy. We do not pose as scientific experts, but have had over twenty years general experience and have records covering a much longer period, and as a result, if the permanent well-being of the tree and its crops only is to be considered, we would vote against planting at distances close enough for the branches to rub together. Perhaps the part of Mr. Petch's work that we studied most closely was the latter half, dealing with diseases, although we found that the section dealing with tapping was of great importance, as it treats the subject very fully; but unfortunately we have not room to deal with either here. The whole book, we feel, will mark an important epoch in the literature of the rubber book-shelf.

"The African Rubber Industry and Funtumia elastica." By Cuthbert Christy, M.B., C.M.(Edin.) 252 pp., including 10 pp. of Index with 110 Illustrations by the Author and others, 10 full-page plates of drawing, a map, and several diagrams. Price 12s. 6d. or 13s. 6d. post free. London: John Bale, Sons and Danielsson, Ltd., 83-91, Great Titchfield Street, Oxford Street, W.

This book was on sale at the Rubber Exhibition, and more than one visitor on seeing it remarked that the book was written by a man who has studied carefully and continuously what he has written about, who quotes no other authority but himself: and who has confidence in his convictions, and is not afraid to say so. With this we cordially agree. The book treats of the history of the rubber industry in West Africa generally; it then goes on to the botany and life-history, &c., of the *F. elastica*, and the rest of the volume is practically devoted to a very full and carefully-worked-out study of this tree.

Indigenous Funtumia, unlike the imported Hevea, we are told, is remarkably free from both diseases and pests; at the same time the tree does contract diseases, and these are discussed in Chapter VIII., whilst tapping and the various methods employed are fully described and illustrated in pp. 126 to 160, the important questions of forest, and plantation yields being dealt with in Chapters XII. and XIII.; then we come to characteristics of the latex, and the matter of its coagulation. Nothing is omitted, and those interested in Funtumia either as a forest tree, or plantation crop cannot afford to pass by such a book.

The question of tapping and yield appeals to us all. We cannot go into the matter here, but assure our readers that in no publication that we have as yet come across have these two items been so thoroughly studied and discussed, by the "man on the spot." *The Times* had an important review of the book in its special rubber number (July 7) and we endorse what it says about Dr. Christy and his work, especially with its concluding remarks: "altogether the author has produced a book of conspicuous merit, affecting every aspect of an industry which needs just these elements of technical science as the basis of development and reform." The illustrations look particularly well, the publishers having evidently spared no pains or expense in the reproduction of what were manifestly excellent photographs.

Rubber. By Philip Schidrowitz, Ph.D., F.C.S., 303 pp., including 5 pp. of index, 83 illustrations and diagrams. Price 10s. 6d. net. 12s. post free. London: Methuen and Co., Ltd., 36, Essex Street, W.C.

Everyone who sets out to make a careful study of rubber soon meets with the name of Dr. Schidrowitz; possibly he is fortunate enough to become personally acquainted with this well-known rubber expert. In his book, now under review, the different branches of the rubber industry, both productive and manufacturing, are described and reviewed in a thorough, practical and critical manner. Dr. Schidrowitz's research work being recorded, whilst, similarly, work carried out by over a hundred other experts is carefully reviewed and compared. In this way we have a wonderfully complete work on the production and preparation of raw rubber at the start, and then pass on to the chemistry, physics, and mechanics of the article in its various forms; these are laid before us in such a way as to interest scientist and planter, expert and layman, manufacturer and buyer alike. It is as practical as it is theorotical, the author having lately made an extended tour through the estates in Malaya and elsewhere, to study the production and preparation of raw rubber in the Tropics; whilst, as is well known, he is a perfect master of all to do with its manufacture on this side.

Studied together with Dr. Christy's book dealing with *F. elastica*, Dr. Schidrowitz's remarks on this rubber in Chapters IV. and VI. will give the reader a very thorough knowledge of this tree, which may yet play a leading part in Africa when its nature, and likes and dislikes as regards tapping have been more carefully studied and are better understood.

The machinery used on the estates and in the factory also receive their share of attention, especially those made by Messrs. David Bridge and Co., Ltd., and Francis Shaw and Co., Ltd., of Manchester. Illustrations of many of their machines are included and the advantages discussed. We congratulate the author on his book, the popularity and appreciation of which is assured.

The Whole Art of Rubber-Planting. By W. Wicherley, F.R.H.S. 154 pp., including index. 23 full-page illustrations. Price, 5s. 6d. post free. London: The West Strand Publishing Co., Ltd., 10, King Street, Covent Garden, W.C., or Tropical Life Publishing Department.

This book deals mostly with Ceará cultivation, over forty pages being devoted to this rubber, and this being so we are sorry that it is not twice the size, as an exhaustive book on the Manihots is badly needed. At the same time *Hevea brasiliensis*, the *Ficus elastica*, *Castilloa*, and other rubbers are discussed, and the book concludes with a chapter on Soya bean cultivation. Mr. Wicherley, as everyone knows, is an ardent believer in close planting, but, speaking generally, we are unable to agree with him. We have said this so often that there is no need to repeat it. If close planting is resorted to

merely as a safeguard against the wind, we maintain that far better results will accrue in the end by planting the trees wider apart, and protecting them by means of a strong belt of coconuts, oil-plants, or other trees of economic value. As a stepping-stone to a fuller knowledge of Ceará, how to plant and tap it, Mr. Wicherley's book will be found of considerable use, but having had the opportunity of studying the trees *in situ*, we cannot help wishing that the author had gone much more into details regarding tapping, or at least to have come to more satisfactory conclusions, based on his own experiences, than we are treated to in this book. However, we shall look forward to being favoured with these later on.

CACAO: ITS CULTIVATION AND CURING. By (the late) J. Hinchley Hart, for over twenty years in charge of the Trinidad and other West Indian stations. 307 pp., including 5 pp. of index, with frontispiece and 64 illustrations. Price 7s. net or 8s. post free. London: Duckworth and Co., Covent Garden, W.C.; The West India Committee, 15, Seething Lane, E.C., or TROPICAL LIFE Publishing Department.

In our March issue, when reporting the death of the author of this work, we mentioned that he was at the time engaged in passing the final proofs of his book for press. In the preface contributed by his daughter, she rightly suggests that its publication will form a lasting tribute to Mr. Hart's memory, and all must agree that whilst we are fortunate in having had Mr. Hart with us long enough for him to have completed this, the last edition of his well-known work, the cacao-producing world is much poorer for his loss.

The work covers the whole ground traversed by the planter in producing "the food of the gods." The varieties, their advantages and drawbacks, are first dealt with, and the pods of each reproduced from photographs in a most natural manner. Land selection, nurseries, planting, the questions of shade, manuring and pruning, are fully discussed and illustrated, each in a separate chapter. We agree with the author when he says that it is impossible to instruct in writing the would-be planter how to plant his estate. The matter of the distance between the trees must depend on local circumstances. Hillsides, high elevations, and poorer soils can take the trees much closer than rich lands at the sea level. "Some," Mr. Hart reports, "have planted 18 ft. apart in extremely rich soil." They were well advised in doing so. Mr. Hart was a firm believer in the necessity of sufficient shade; but here, again, as with the knotty question of the distance to plant, local conditions must be considered. No shade is required in some centres, whilst with others the trees and the soil must be protected from the sun and wind alike. Much the same can be said about manuring. Not only do the requirements of different estates vary considerably, but even on the same estate considerable variations in the make-up of the manures are absolutely necessary.

Needless to say, the questions of diseases and pests, their prevention and cure, are very fully dealt with, so are the cropping and fermentation of the beans, the agricultural chemistry of cacao, and the question of transporting the seeds and seedlings. The planter who does not secure a copy of this work will be very unwise.

MACHINERY AT THE RUBBER EXHIBITION.

Great Advances in its Utility and Capability noticeable on all Sides.

OVER THIRTY ENGINEERS EXHIBITING.

THE most casual layman present at the 1911 Rubber Show is bound to notice the great advancement in all ways in the machinery he saw working compared to what was shown at the Olympia Exhibition three years ago. The machines of to-day are much more powerful, and the single machine tends to give way to the complete installation, or, with the larger engineers, to continuous plants to treat and work the latex from the time it is drawn from the tree until it is ready to leave the estate for shipment. The milk goes in at one end and the finished rubber comes out at the other. In 1908 everyone, engineer and estate owner alike, was only in the throes of experimental work and just merging from the homely cloth-mangle and ordinary soup-plate stage. To-day, whilst realizing that they are still only half-way (if as far) to the ultimate state of perfection that they mean to reach, they feel themselves to be in the right groove, and that with a little patience and perseverance and the expenditure of further sums of money on experimental work, they now run every chance of evolving just the machine required for the various processes involved and varieties of rubber to be treated.

Before giving details of their exhibits we would point out that among the leading firms exhibiting were (the names in brackets are their chief representatives):—

David Bridge & Co., Ltd., Castleton, Manchester (Mr. Robert Bridge, Mr. John Bridge, and Mr. Leslie Radclyffe).

Francis Shaw & Co., Ltd., Corbett Street Ironworks, Bradford, Manchester (Mr. Osman Shaw, Mr. Rupert T. Cooke, and Mr. J. Darnley Taylor).

Riley, Hargreaves & Co., Ltd., of Singapore, with branches at Ipoh, Penang, Malacca, &c., and Bertrams, Ltd., of Sciennes, Edinburgh (a joint exhibit), represented by Mr. Donald Miller and Mr. Robins (representing Messrs. R., H. & Co.), and Mr. R. F. Gillespie and J. D. Robb (representing Messrs. Bertrams).

Messrs. Werner, Pfleiderer & Perkins, Ltd., of Westwood Works, Peterborough (Messrs. Kurt, Walter, and O. Pfleiderer and Mr. W. A. Shepheard).

Messrs. Robert Warner & Co., Ltd., of Walton-on-the-Naze (Mr. Sydney Ingram and Mr. F. E. S. Lindley).

Messrs. Howarth Erskine, Ltd., Singapore.

Messrs. Crossley Bros., Ltd., of Openshaw, Manchester (Mr. Hitchin).

Messrs. W. H. Cochrane & Co., 110, Cannon Street, London, E.C. (represented by Mr. W. H. Cochrane).

Emil Passburg (Vacuum Dryers), Berlin (Mr. Jas. Livingston, of Gt. St. Helens, London, E.C.).

The Birmingham Iron Foundry, Derby, Conn., U.S.A. (The Continental Rubber Co., who were using their machine).

John Gordon & Co., 9, New Broad Street, London, E.C. (Mr. Harry S. Smith, who was in charge of his centrifugal coagulators, Mr. T. Watson, and Mr. F. O. Bailey).

Davey, Paxman & Co., Ltd., Standard Ironworks, Colchester.

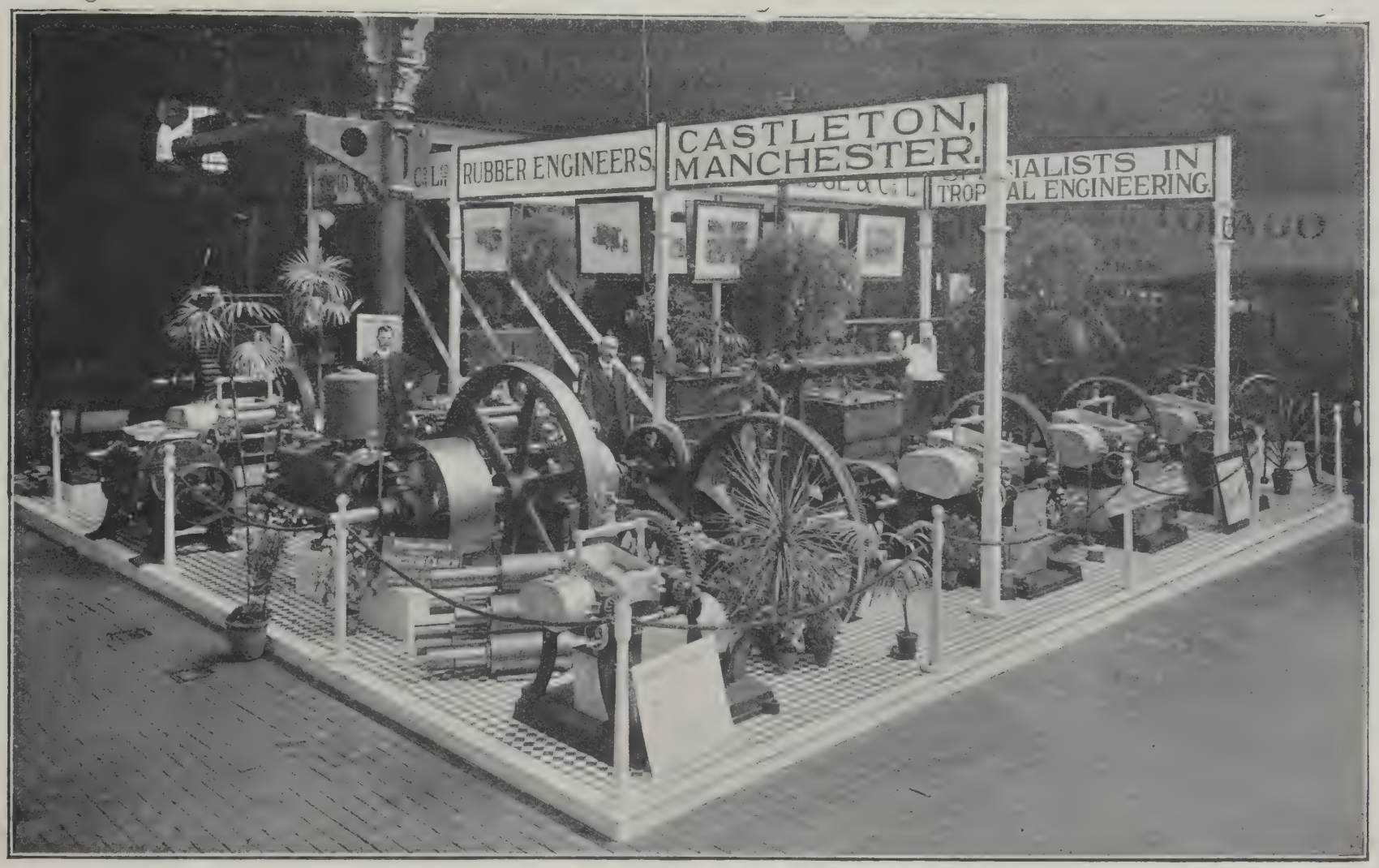
Trewhella Bros., Trentham, Victoria, Australia, and 6, Alma Street, Soho; Smethwick, Birmingham (Messrs. B. H. Trewhella, B. T. Drummond, and W. Adams).

Brown & Co., Ltd., Colombo, Ceylon (Mr. F. W. Whitehead and Mr. Mitchell).

Aylesbury & Garland, Ipoh, Singapore (Mr. Garland).

The Tyneside Foundry and Engineering Co., Low Elswick, Newcastle-on-Tyne (Mr. Oswald Elsworth).

in the Barford Street annexe, showing the Da Costa coagulator actually working. This firm claims, and we feel with justice, to be the leading engineers in the rubber world in making machinery for dealing with plantation and wild rubbers, also machinery for the rubber manufacturer in every section of the rubber, gutta-percha, and balata trades. The characteristic of their chief exhibit, which occupies over 1,500 ft. in the centre of the plantation exhibits, between Trinidad, Tobago, Ceylon and Southern India, is the thorough way in which it covers the whole of the ground, producing or manufacturing, of the rubber industry, and its requirements from the time that the tree, vine, or bark, is first deprived of its latex up to the period when the manufacturer turns out the finished article, motor or cycle tyre, rubber hose or sheeting, flooring or tiles



View of Messrs. David Bridge & Co.'s, Ltd., Stand, showing a Battery of Machines, Da Costa Coagulator, &c.

Brown & Davidson, Ltd., Talawakelle, Ceylon.

J. & P. Hill, Ordnance Works, Bernard Road Park, Sheffield (Messrs. Badhams, Booth, Walker, &c.).

Hampson Bros., Ltd., Clayton Lane, Clayton, Manchester.

Wallach Bros., Ltd., Royal London House, Finsbury Square, E.C. (Mr. F. H. Eve).

John Yates & Co., Ltd., Aston Manor, Birmingham (Mr. J. L. Marrian).

Blackstone & Co., Ltd., Stamford, Crude Oil Engines (Mr. Simper).

Coming now to the details; Stall No. 6 we found occupied by Messrs. David Bridge and Co., Ltd., Engineers, Castleton, Manchester, who, not content with this, also had a large space for their office in King George's Hall, as well as machinery in motion exhibited (of which splendid specimens abounded on all sides of the exhibition), &c., &c.

On entering their stall one notices the tapping knives, "Huber," "Bi-Huber," "Uganda," &c., for obtaining the rubber milk and the latex-cups, pails, &c., for collecting and straining it. The oil-engines necessary to drive the battery of machines (all driven by their well-known Heywood and Bridge's Patent Friction Clutches and Patent Cutgear), for washing, macerating, crêping, and sheeting the coagulated rubber for shipment, are all to be found there; nothing has been forgotten, nothing is missing. Here is a complete installation of the firm's well-known friction-clutch mechanism for driving the machinery on the estates or in the factory. By means of this arrangement the machines can be run at any speed, and

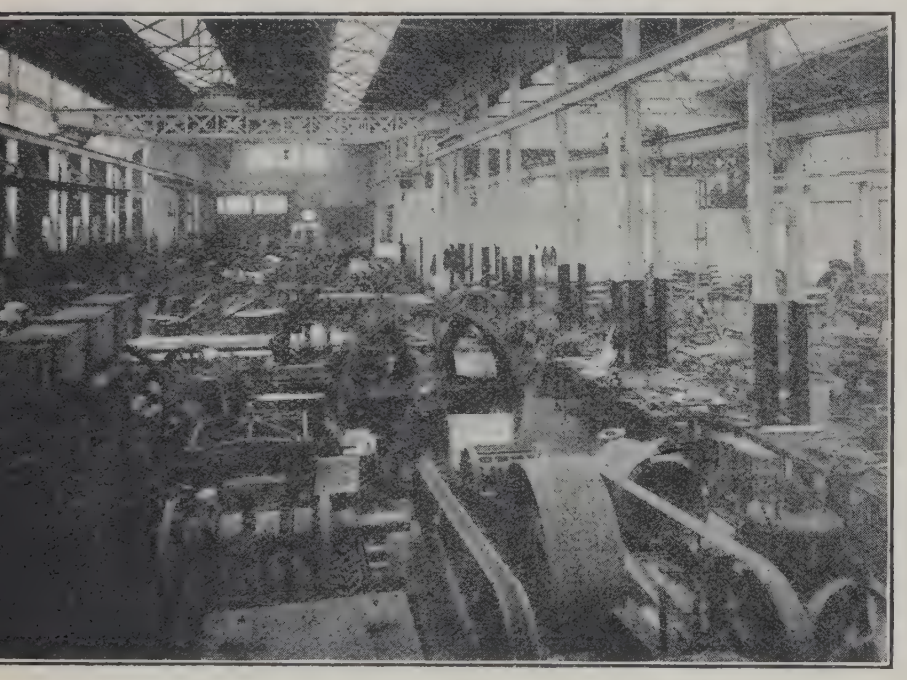
driven either way without shock or jar. Everything is perfectly balanced, and so runs smoothly and treats the rubber without affecting its resiliency.

We then come to their Hydraulic Pump and a Battery of Patent Hydraulic Presses, in which the rubber, whether sheet or crêpe, is placed and kept under pressure. This, it is claimed, improves its quality and lasting power. Behind is the firm's well-known vacuum-dryer, as well as their "Dacostidge" Patent combined Rubber Vacuum Drying and Surface Smoking Plant for drying and surface-smoking the rubber under vacuum. Another feature—we were going to say "feather" in their stand—is the "Triang" Patent *three*-roller rubber mill for macerating, washing, crêping, sheeting, and blanketing the raw rubber: the model shown being known as the "Coronation" machine. This machine, they claim, is far in advance of anything yet put on the market for preparing either plantation or wild rubbers. By means of the third roller, the capacity of the machine is almost if not absolutely doubled, and hence floor-space, as well as the prime cost, economized. Tall and powerful is the Grinder close by, with its 18 in. rolls for grinding up old rubber, such as cab tyres, hose, &c., for devulcanization previous to re-forming. The ring-cutting machine is a nicely-adjusted instrument and sensitive in its work.

A curious but solid machine of intricate make and excellent finish is the firm's patent "Equal Pressure" Wrapping machine for making inner tubes for motor and cycle tyres, &c., a machine that has proved so great a success that one firm sent nineteen repeat orders, taking twenty machines in all.

Their machine for cutting outer tyres will, we feel, commend itself to tyre manufacturers, motor, cab, or otherwise, as being specially suitable for reclaiming work. Close by is the hydraulic press with five "day-lights" for making the rubber heels now so universally worn, and moulded work generally.

Last, but not least, a word more about the "Da Costa" coagulating-plant, which has achieved lasting fame by being chosen as *the* method for use on the first plantation rubber estate in Brazil, proving by its adoption in the home of the *seringuiero* and his well-known *pelles*, which are tedious and costly to make, that it is recognized in Brazil, as elsewhere, as the perfect coagulator for rubber planters. At the demonstrations we were shown the entire process incurred in turning the latex into rubber, first by means of the "Da Costa" coagulating and smoking process (*i.e.*, the apparatus which actually coagulates the latex), and then by passing the rubber through their crêping and sheeting machines, and so preparing it ready for shipment according to the requirements of the market. This machine, as is well known, was invented by Mr. J. Simao da Costa, a leading Pará rubber expert, and since the 1908 exhibition, at which a model only was shown, it has excited widespread attention, and been adopted by many estates in the East and West alike. The process is simple, the beneficial results lasting and assured, and the cost, in comparison, low. What wonder, therefore, that most planters went to see the "Da Costa" Latex Coagulator at work, and study its mechanism, especially when this could be done so cheaply, easily and effectually as was the case at the (1911) Second International Rubber Exhibition.



Two views of the Interior of Messrs. David Bridge & Co.'s, Ltd., Works at Castleton, Manchester.

An interesting exhibit that was included in the Dutch section was the experiment plant made by Messrs. David Bridge and Co., Ltd., for the Dutch Government's Technical School at Delft, Holland. This included a Washing Mill, Mixing Mill, and Calendar, driven by electric motor, and Heywood and Bridge Patent Friction Clutches, all mounted on a single combination bedplate for laboratory work; a true case of "*multum in parvo.*"

In their Coronation Souvenir (see advertisement, p. xxvii), Messrs. David Bridge & Co., Ltd., Castleton, Manchester, include articles on Pará rubber, Ceará rubber, Castilloa, Funtumia, Landolphias, Rubber in the East Balata, Jelutong. There are five portraits and ninety illustrations of rubber planting and estate machinery.

WERNER PFLEIDERER & PERKINS, LTD.

In our last book on rubber estate management* we give a very detailed account of the "Universal"

* "Soil and Plant Sanitation on Cacao and Rubber Estates." Price 11s., post free.

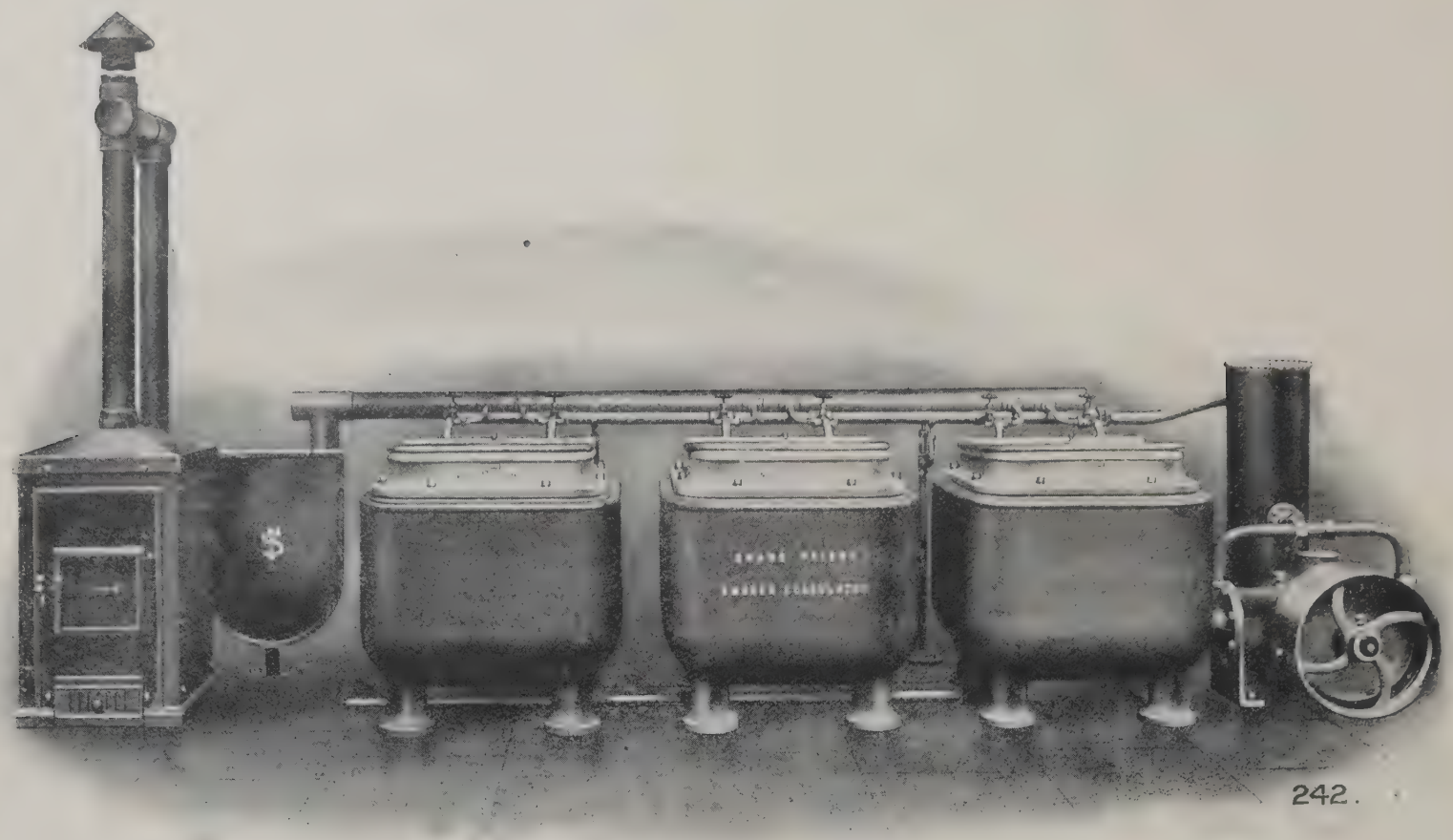
washer; this machine has several interesting points about it, the chief of which is that the rubber, after being put into the trough, needs no attention, but can be left to wash itself automatically. This is due to the construction of the machine, and the shape of the bottom of the trough. The edges of the blades or heavily corrugated rollers, do *not* interlock, they do not even touch, but are a certain distance apart, which increases their ability to draw in and thoroughly wash the rubber without punishing it. The blades take hold of the contents of the trough, and carry them below, where owing to the slopes of the sides it is forced up again, seized and worked, continually and automatically as long as desired, all the time coming again and again to the surface, so that it can at once be seen when it is clean enough to be taken out. All this is done without excessive squeezing, and no harmful tearing at or rupture of the tissues of the rubber. The makers on this account claim that the full life and nerve of the rubber is preserved by being washed in a "Universal" machine. Meanwhile the grids and strainers receive and remove the dirt, and impurities, &c., which the action of the blades releases from the rubber, and brings to the surface, when it is washed away over or through the strainers to the outlet below, leaving the rubber clean and intact. If pieces of wood are met with, they are removed unbroken and so do not get further splintered up and forced into the rubber.

Messrs. Francis Shaw & Co.'s, Ltd., Stand.

Francis Shaw & Co., Ltd., Manchester.

Being somewhat interested in vine rubbers on account of the excellent connection that Tropical Life enjoys among those in Africa, exploiting this source of production, one of the first items that we noticed in Messrs. Francis Shaw & Co.'s, Ltd., extensive exhibits in the centre of the main hall (they also had a stand in the Barford enclosure, showing the interior of one of their rubber-smoking sheds, and a second stall in the main hall with a complete large-sized vacuum drying plant), was the Valour rubber-extracting machine, of which Messrs. Francis Shaw & Co., Ltd., are the sole manufacturers for the Valour Rubber-Extracting Machine, Ltd., 31, Copthall Avenue, London, E.C. This machine is so extremely simple, portable, and strong in construction, that skilled labour for operating, transport charges when being carried from one part of the forest to another, and the possibility of breakages or high maintenance charges need not be seriously considered.

The machines are usually run in batteries of twelve units, a number dry-crushing and a number washing the rubber extracted by the dry-crushing machines. Each battery has an approximate capacity of 3,000 lb. of bark per day, the extraction of rubber depending on the class of bark being treated. The quality of the rubber shown as having been prepared by the Valour was certainly excellent, and the machine, whether



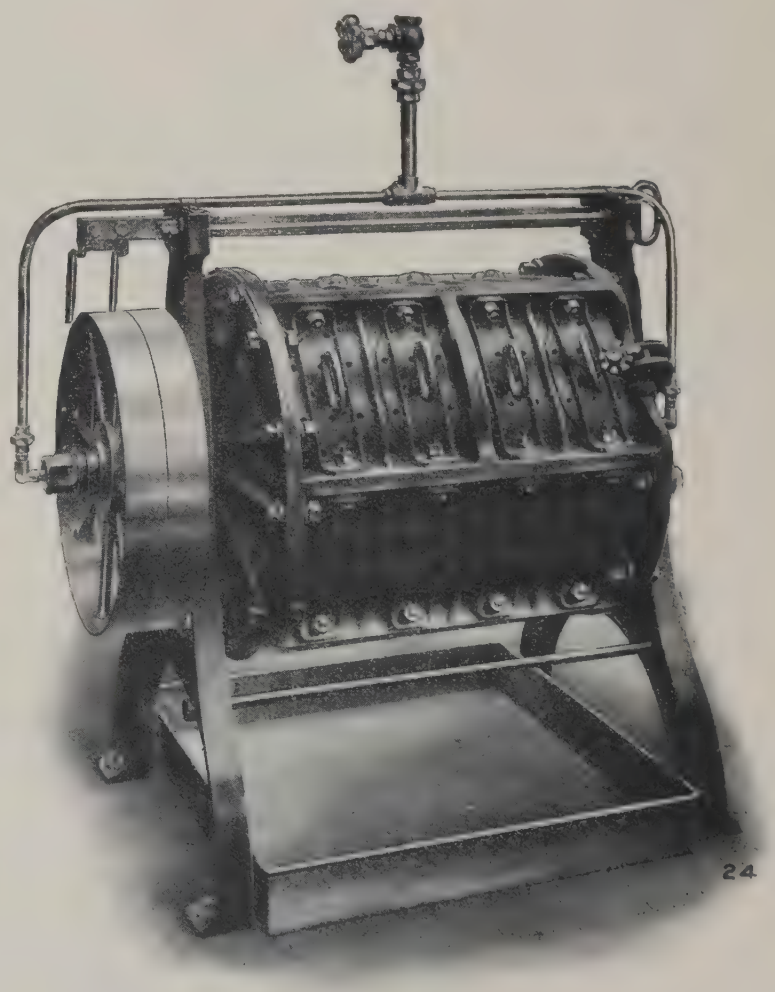
The "Shaw" Smoke Coagulator, showing the porcelain tanks with aluminium fittings.

worked at a central depôt or in the bush, appeals to us as likely to be of use to those interested in the extraction of rubber from the bark of rubber vines.

On Wednesday (July 12th), before the Exhibition closed, a large number of visitors saw the machines in actual operation in London, resulting in considerable business being done.

We understand that the machines can be seen in operation in London by applying to the Company.

Messrs. Shaw's general exhibits were typical of the improvements that have taken place in the finish, capacity, and completeness, either of individual machines or of complete installations since the last exhibition. Their patented apparatus for coagulating rubber by the smoke process, and known as the "Shaw" smoke-coagulator, has been carefully thought out, and shows skill and originality in construction, as can be seen by the accompanying illustration; the chambers to hold the milk are lined with thick porcelain, so as to avoid its coming into contact with the metal. This apparatus coagulates rubber by the smoking process, smoke being forced through the latex by means of compressed air. Coagulation in this manner is effected without boiling the latex, and the temperature at which coagulation takes place can be regulated to whatever degree of heat is found most advantageous, whilst the porcelain tanks and aluminium fittings keep the latex or rubber perfectly clean. Owing to the great interest evinced in this plant, Messrs. Shaw have arranged with a number of well-known planters and estate managers to carry out a series of tests at their works to demonstrate the efficacy of their method. This apparatus has already been installed in the Federated Malay States, West Africa, and Mexico, regarding which most satisfactory reports have been received. The general appearance of their macerating, washing, crêping, and sheeting machinery, was one of increased strength and capacity, and they looked fully capable of



The "Valour" Machine for treating Vine Rubber and Rubber Bark, as exhibited by Messrs. Francis Shaw & Co., Ltd.

dealing with the larger yields now being obtained on all sides by the estates. A battery of their rubber washing, crêping, and sheeting machines make an entirely new departure from previous machines of this description. There is no complicated arrangement of gearing in front of the machines for adjusting the front rollers, all this being totally enclosed inside the frames, and combined with a safety device to prevent damage to the machines by unskilled operators. These, the first machines made combining these advantages, have been readily appreciated by planters and estate managers. Drying by the "Shaw" vacuum chambers was being explained to visitors as we passed, and the firm has great expectations from their vacuum dryer in the future. Agreeing with those who believe in leaving rubber under pressure, or of blocking their rubber, a battery of rubber-blocking presses was included on the stand. We understand Messrs. Shaw have booked some heavy orders both at the Exhibition and immediately before it, and have retired back to Manchester for six or twelve months' stiff work, to avoid, in spite of large extensions to their premises, any delay in delivering the special orders just received as well as those to come along in the usual course of events. This firm, Mr. J. Darnley Taylor, their London representative, tells me, specializes in machinery for treating Castilloa and has shipped large and very complete plants for this rubber to Mexico and elsewhere.

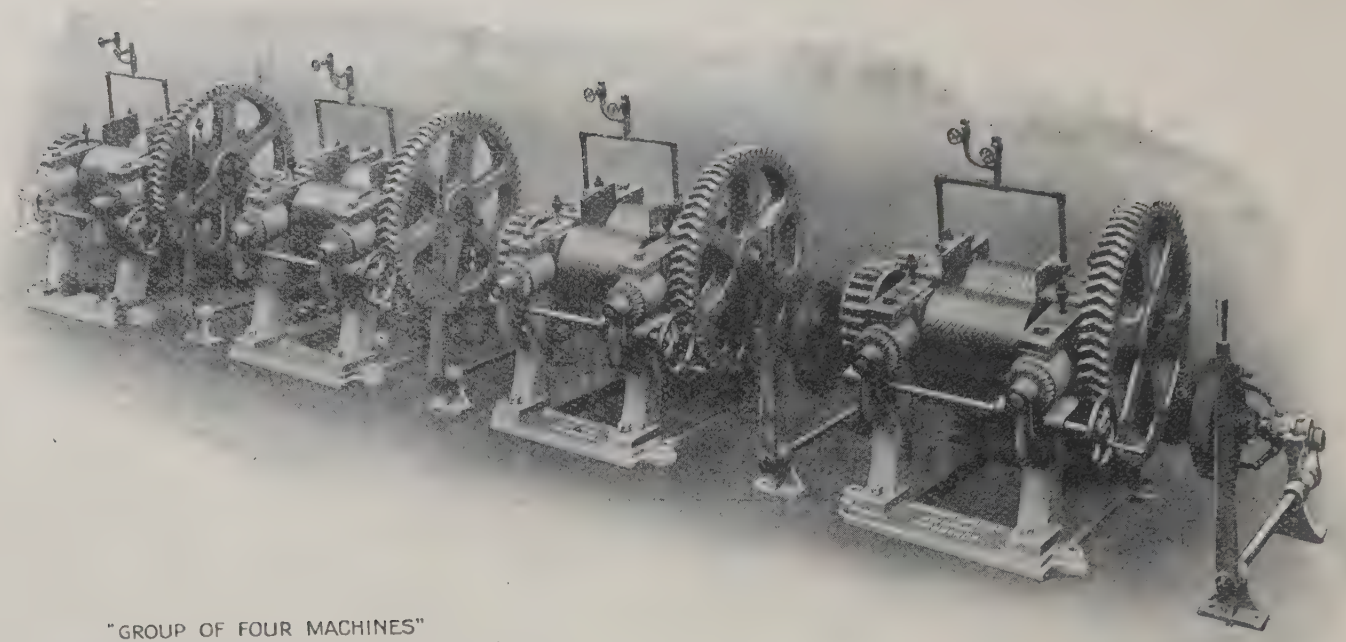
Messrs. Riley, Hargreaves & Co.'s Stand at the Rubber Exhibition, showing Messrs. Bertrams', Ltd. (Sciennes, Edinburgh). Rubber Machinery, the "Crompton" Lamps and Fans, and "Ruston" Gas Engine and Producer.

BERTRAMS, LTD. (Sciennes, Edinburgh); RILEY, HARGREAVES & CO., LTD., Singapore, and branches throughout Malaya.

This exhibit under the banner of Messrs. Riley, Hargreaves & Co., Ltd., was the centre of much attention, as combined with a very complete battery of estate rubber machinery they showed the Crompton-Blondel Flame Arc Lamps, for lighting rubber factories and yards, tropical residences, and general use. The light was strong, but not glaring, whilst the mechanism is described as being very simple, requiring but little attention, and not liable to get out of order. For these reasons the makers claim that the light is eminently adapted for use where skilled labour is scarce or at a premium. Crompton ceiling fans, efficient and noiseless, for offices, factories, and private residences in the Tropics, were also shown. Included in this exhibit was a "Ruston" suction gas engine and producer, this being the motive power now generally used on rubber estates for driving the machines.

In conversation with Mr. Miller, who represented Messrs. Riley, Hargreaves, we understand that this firm are not merely merchants and factors, but actual machine and factory constructors and engineers, capable of turning out in the East itself plants of any dimension and capacity, not only for rubber, but for mining, coco-nut, and oil factories, and other tropical industries. The firm undertakes the complete erection of factories and residences, from choosing the site to fitting up the buildings with fans, lights, ventilating apparatus, &c. They also supply motor and steam launches for water transport. They hold complete stocks of rubber machinery and estate supplies of all kinds, as well as of electric installations and appliances.

Coming to the rubber machinery, these exhibits were all made by Messrs. Bertrams, Ltd., of Sciennes, Edinburgh. What appealed to us about them was that we had here not a battery got up for the occasion, but a plant made for hard work and actual use, as the whole of the exhibits formed part of an order, and was, at the close of the Exhibition, to be shipped out to the East. Their macerating machine had deep, chilled, coarse grooved rolls, the front roller having a worm adjusting gear; the whole driven by a "Moore and White" patent friction grip. Their washing and crêping machines were shown similarly equipped, and can be supplied with straight, diamond, spiral, or other rolls.

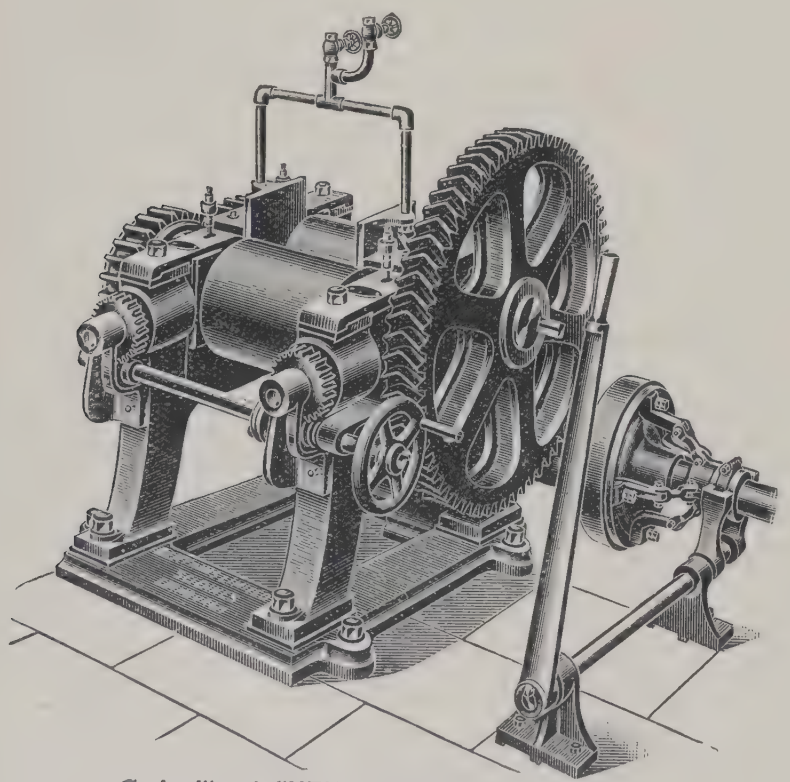


A Group of Plantation Machines made by Messrs. Bertrams, Ltd.

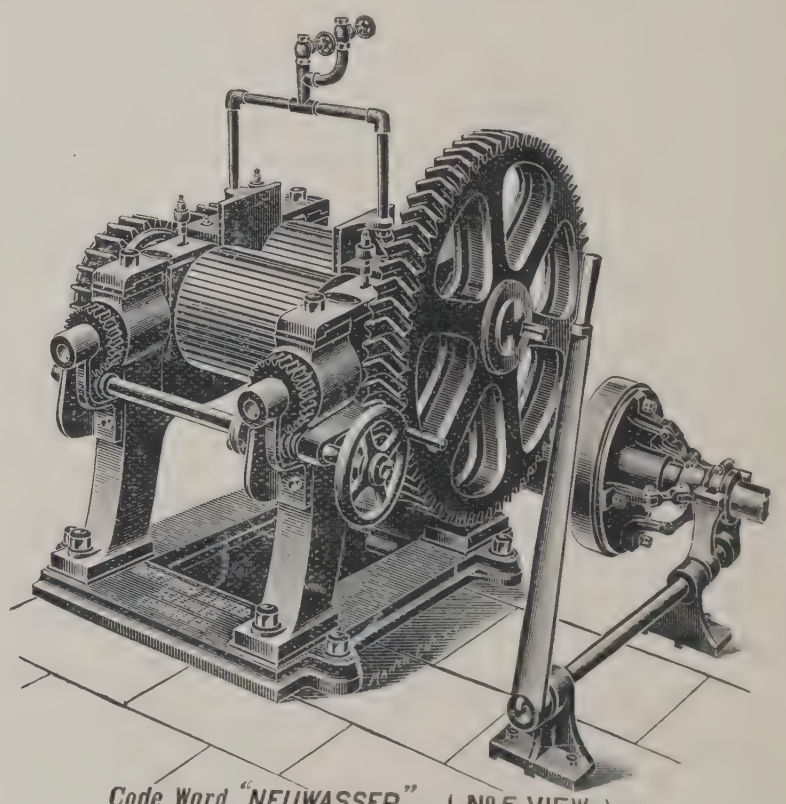
The sheeting machine had deep, chilled iron planed rolls, all the machines being fitted with spray pipes for hot or cold water connections, and tray for catching the rubber as washed. A feature of the "Bertram" machines is their improved roll adjusting gear, whereby all backlash is obviated by the use of accurate cut gearing, and the springs introduced between the blocks.

The above shows a battery or group of the now well-known "Bertram" plantation rubber machines, as exhibited at the Rubber Exhibition. These are provided with diamond-cut rollers, as can be seen, but plain, straight-cut, spiral, double-spiral, or square-cut rolls can be supplied if desired. Every machine made by Messrs. Bertrams, Ltd. (Sciennes, Edinburgh), is of the most up-to-date construction, embodying all the latest improvements, whereby the method of washing the rubber is as near that of the kneading process when done by hand as possible, just avoiding tearing the rubber and so spoiling the strength and nerve of the resultant produce to be shipped.

The machines, as illustrated, are driven by a main shaft, without the use of belts. The rolls shown are 12 in. in diameter and 15 in. long, and made of chilled iron turned all over and grooved as desired. The side frames are of strong design, bored out and machined to take safety bushes. These are fitted in the front of the frames, and so designed that they will break if any undue strain occurs, as when any foreign material gets between the rolls. By this means a serious breakdown is avoided, and the cost for repairs reduced to a minimum, as the bushes can be replaced in a few minutes from the front of the machine, without having to remove rolls or covers. The guide plates



A "Bertram" Sheeter.



A "Bertram" Washer.

used will commend themselves to the planter, as they are so closely bedded to the rolls that the rubber cannot work into the bearings, try as it does to get there. At the same time any chance of the rubber becoming oiled whilst being treated is avoided.

As can be seen, these machines are carried on box-section, cast-iron base plates, planed to receive the frames and plummer blocks. Perfect alignment of the whole battery, and hence even, easy working, is assured, while the erection of the plant is so easy that it can be put in place by unskilled labour under white supervision. The seats for the main bearings for the driving shaft are cast with the soleplates of machines, thereby greatly facilitating the erection of machines and gearing.

Emil Passburg.

Now we had the pleasure of greeting Mr. James Livingston, who represents Messrs. Passburg in London. The firm did not exhibit their vacuum dryer, as being so well known it was unnecessary to do so. They confined their energies therefore to seating you in a comfortable chair and showing, by means of photographs and illustrations, why the Passburg vacuum dryer has become so popular on rubber, cacao, and other estates abroad, and in factories all over the world. Some 350 of their plants have been supplied to india-rubber works and plantations, and the samples of the rubber treated, block, sheet, or crêpe, exhibited on their stall, show how well the machines do their work, the clear, hard, firm quality of rubber, and its entire freedom from any tackiness, leaving nothing to be desired.

Robert Warner & Co., Ltd.

This well-known engineering firm, whose works are at Walton-on-the-Naze, showed a varied and interesting exhibit, well worth a visit. They were unfortunate in their space, being in a dark, out-of-the-way corner. Another time we would also recommend them to show their machines in motion and not, as on this occasion, standing still. Their machines looked strongly built and included crêping and sheeting machines for hand and power, a newly patented coagulator, of which they expect great things, a powerfully belt-driven spray pump, factory and hand pumps. The hand rubber machines shown were of the single gear and compound gear types. This compound gear type enables the layers of crêpe to be pressed together up to a thickness of 1½ in., an advantage possessed by all sizes of machines of this class, and some good specimens of crêpe made through their machines were on view at various stalls throughout the Exhibition. The new coagulator is likely to have an extensive future, being light, portable, and inexpensive. The main features of the coagulator are that it consists of a small vacuum pump, which can be worked by hand or power, attached to a latex tank, which in its turn is connected to a firebox. The latex tank is jacketed for hot water or steam. When the vacuum pump is in motion it exhausts the air from the latex tank, and the smoke from the fire immediately bubbles through the latex and gets intimately mixed with it as it coagulates. The cover, having no need of any bolts or fittings, is easily lifted off, and the rubber removed to the washing and rolling mills.

The spraying pump for pest extermination exhibited was of their well-known three-throw vertical ram type, with a single-acting pump working independently. The single-acting pump delivers the water into two tanks where it is mixed with insecticide and a continuous stream of water can then be led through large areas. The total vertical lift is 500 ft. or 216 lb., pressure per square inch, and 1,800 gallons of water per hour can be sprayed. The water can be forced through about 4,000 yards of 2½ in. piping. The value of this pump is incalculable to a plantation or any place where a large area has to be treated, and of course can be used for irrigation purposes, as well as, we believe, for applying fertilizers in liquid form. The horse-power required is about 7 h.p. The "Naze" pump is a simple and efficient pump and quite sufficient for factory purposes. It is made in three sizes suitable for 100 ft. lifts and capable of delivering 300 to 1,000 gallons of water per hour, a very useful pump for estates. In addition to their machines a large collection of photographs were on view illustrating the various types of pumps, windmills and other machines made by the firm, but which lack of space prevented their showing.

W. H. Cochrane & Co.

This firm, which specializes in the erection of rubber smoking houses, factories, &c., as well as machinery, showed two of their "M" type of rubber-washing machines, fitted with their 12 × 15 in. non-rusting grooved rollers, driven by means of a shaft and friction clutch from the back of the machines. Near to these machines was a third one with 9 × 18 in. hard cast-iron rolls, and a belt-driven "K" machine. All these were fitted with an ingenious but simple trough arrangement underneath the rolls to receive the rubber as it passes through them, and bring it forward for those in charge of the machine the more easily to pick it up and place it on the rolls for another washing. This greatly facilitating as well as expediting the process. At the same time the dirty water escaped into a trough, leaving the washed rubber behind.

We were much interested in the designs of this firm's drying houses, which are fitted with an arrangement that should at times, if somewhat modified, also render it useful for cacao drying, &c.

Venesta, Ltd.

Here we were able to introduce those visiting our own stall, which faced that of the Venesta Company, to the Wardian case that, some time ago, they were good enough to put up to our design so as to obtain a lighter, but equally strong, case than those made with other woods. The firm certainly can be congratulated on the case they have put on the market, and which by now has become well known both to cacao and rubber planters, since it has been acknowledged that if rubber seeds are to turn out a success at the buyer's estate, he must, like the buyer of cacao seeds, ship them in a Wardian case, allowing them and even encouraging them to germinate and grow on the journey. Far better to ship 10,000 seeds in this way and save all, or nearly all, than send 500,000 seeds by post and rear only a few plants. A great advantage in using Wardian cases is, that by them you can detect fraud or carelessness, and bring home to the seller

that his seeds were not good at the start, for if they do not germinate in a Wardian case, they must have been dead when put in.

Besides their Wardian cases, the firm also showed a complete set of their patent waterproof ply-wood cases for packing rubber or tea, whilst the same boarding is equally serviceable for export cases generally, large or small. With rubber their use is strongly recommended as the inside of the cases is smooth and free from splinters, sawdust, dirt, &c., thus enabling buyers to use the contents right off without having to first wash the rubber, which cannot be done with rough sawn cases. These cases also save, it is claimed, 10 per cent. to 20 per cent. in freight measurement, and weigh, compared to other cases, 40 to 60 per cent. less. At the same time we offer rubber-planters a word of warning. During the Exhibition a cinematograph showed rubber in the production, and we noticed that whilst Venesta cases were used, the natives, when packing the sheet rubber, hopped in and out of the cases to press down the contents with their feet. Surely in doing so there is considerable danger of dirt being introduced and the care taken to ensure perfect cleanliness rendered useless.

In the Dutch Section were the International Guano and Phosphate Works, of Zwyndrecht, Holland. Now that manuring on rubber, cacao, and other estates has come to be recognized as absolutely necessary, the various fertilizers shown by this firm received the careful attention of those who inspected the Javanese court in which the Dutch Government had so tastefully housed their exhibits. Full particulars of their manures, and the crops for which they are specially applicable can be obtained on addressing them at Zwyndrecht (see Advertisement, page ii). We might add that at TROPICAL LIFE stall we had some thousands of reprints on manuring Hevea, Manihot, and other rubbers, and succeeded in distributing a large quantity, the visitors expressing great satisfaction at receiving them.

Reports of the machinery stands of Messrs. John Gordon and Co. (London), Crossley Bros., Ltd. (London and Manchester), The Crude Washing Co., Ltd., The British Murac Syndicate, Ltd., Davey Paxman and Co., Ltd. (London and Colchester), Blackstone and Co., Ltd. (Stamford), and others are unavoidably held over for our August issue, when we shall also include special articles on the "Harry S. Smith" centrifugal coagulating machine, and the two synthetic rubbers exhibited at the Agricultural Hall.

MESSRS. TREWHELLA BROS., AUSTRALIA AND BIRMINGHAM.

Much interest has been manifest of late by the numerous articles that have appeared in TROPICAL LIFE and other journals dealing with rubber cultivation and the dangers centred round the young plants by the root diseases caused by a fungus, which spreads from decaying logs and stumps of trees that have been felled; and the truth of these articles has been confirmed by Mr. Petch's book, reviewed elsewhere in this issue. It has been repeatedly noticed that plants which are growing in close proximity to a fallen log or stump may sooner or later die, and on several occasions, after examination, fungi threads have been traced directly from a rotting stump to the roots of the young plants. This constitutes a great danger to the cultivation, and to warrant the success of a plantation, great care should be taken to see that no stumps or dead roots be allowed to remain. There can be no doubt whatever that if rubber and other companies want to have their estates free of disease, it is absolutely necessary to grub up the roots and stumps; the cost of so doing is but a small item compared with the ultimate loss the planter will otherwise sustain. An inexpensive and a thoroughly reliable and efficient implement for uprooting trees, stumps, and general heavy work of clearing forest and other lands, was shown at the Exhibition, Stand No. 86, by Messrs. Trewhella Bros., a firm with considerable experience in forestry work and in clearing the land of trees for cultivation. Their well-known Australian monkey-jacks were a popular exhibit, attracting both inquiries and orders to the satisfaction of the patentees. These jacks, Messrs. Trewhella tell us, have become so popular owing to their great utility and efficiency, and also their simplicity and low cost, that their use is practically spread over every country of the world.

THE WILKE TRADING COMPANY.

This firm, well-known in Paris, where their head office is situated, were not exhibiting, but displayed a large advertisement next door to our stall, near the entrance, and two members of the firm (Messrs. John and Louis Wilke) visited the exhibition towards the close, and inspected the machinery of Messrs. Robert Warner and Co., Ltd., whom they represent in the Dutch Indies, where Mr. John Wilke will shortly proceed. Of Dutch extraction, the partners, we found, could talk French, English, Dutch or German with equal facility, and seemed most enthusiastic and hopeful about the prosperity of the rubber market, and its effects on the demand for machinery and estates supplies as exported by them.

THE KALI OR POTASH SYNDICATE.

This was one of the most popular stalls in the Exhibition, not because the general public realized that potash is as necessary for plant life, as blood for the body, but because here was something that appealed to the eye, and I fear the palate more directly than rubber, viz., well-grown apples from British Columbia of large size, bright colours, and excellent flavour, pears, probably Duchesse, from New Zealand, that would have fetched a shilling each if sold by the pound, and grape-fruit from Messrs. Freudenburg, of Ceylon, that will cause the West Indies to look to their laurels for size and flavour. The exhibits that appealed to us were the bananas from Queensland, which must have been five or six weeks on the voyage, and yet arrived in perfect order in every way. After this, if anyone says that they are too far off to ship bananas to England or the Continent, they will receive no sympathy from us. Possibly the potash had something to do with it, in which case an assured success need not be delayed. Pine-apples grown by Mr. J. T. Wilson, State School, Woombye, Queensland, elicited much praise from the elders, and raised hopes of participation among the juniors which I fear were not realized. Mr. J. W. Killen, of Felton, Delaware, U.S.A., and Mr. Joe Dahl, of Hamlet, Indiana, showed, by the fine ears of corn that they sent to the stall, what benefits a judicious use of potash confers upon maize-growers.

With the boom coming up in coco-nuts a comparatively large exhibit of these caused numerous groups to collect around them nearly every day. They were raised by A. E. Rajepakse of Alexandra Coco-nut Estate, Jaela, Ceylon. Last, and most prominent of all, were two tall Hevea trees, " Mit Kali " and " Ohne Kali," the former showing the larger girth obtained by four-year-old trees through the use of potash. The two trunks showed a marked difference in size—the one treated with potash being twice the girth of that receiving none, as can be seen in our illustration of them.

View of the Potash Syndicate's Stand

Showing the increased growth of the rubber trees by the use of potash, and also the increased size and number of coco-nuts.

Acme Chemical Co., Ltd.

This firm, whose laboratories are at Tonbridge, in Kent, and Bolton, in Lancashire, are well-known experts in weed destruction and insect extermination, and were exhibiting samples of their various preparations on Stand 80, nearly opposite our own. They are makers of all chemicals used in agriculture and horticulture for combating diseases in plants, having made this their study for over a quarter of a century. Their preparations are used in all parts of the world, but especially in tropical countries for the extermination of such insect pests as locusts, white ants, caterpillars, &c. It was interesting therefore to notice on their stand such chemicals as arsenite of soda, which is said by Mr. E. V. Wilcox, Special Agent in Charge of Hawaii Experiment Station, to have practically solved the difficulties of cultivation for all who wish their land to be free from weeds. Arsenate of lead is another chemical we noticed which is certain death to all leaf-eating insects, and is rapidly taking the place of Paris Green for this purpose. It is sold in the form of paste and only needs to be mixed with water and sprayed on to plants which are subject to attack of leaf-eating insects. It is also prepared in powder form and applied by powder-distributing machines. There was also a powder for destroying all fungoid growths. This can be applied direct to the plants or drilled into the soil. " Fumerite," a soil fumigant, destroys ants and all other insects, worms, &c., in the soil. Some excellent spray distributors and limewashing machines were also included in the exhibit, and commended themselves to the numerous visitors at the stand on account of the pumping apparatus being outside, and no rubber or leather fittings being used, as these deteriorate too rapidly for tropical use. These powder distributors and sprayers are supplied either as knapsacks, or on wheels, for man or horse power. Planters would do well to inquire of the Acme Chemical Co. for any estate requisites they require to remove plant diseases and noxious weeds on their plantations.

Walter Voss & Co., Ltd.

In the centre of King George's Hall, hemmed in between the two lions of the show, *i.e.*, the Silberrad Synthetic Rubber, and that made by the Caoutchouc Syndicate, we found Mr. Walter Voss and " Fungal." The three of us were already old friends, as we have often approached Mr. Voss when inquiries came to hand *re* pests and diseases attacking cacao, rubber, or coco-nut trees. Mr. Voss contends that, from the advice he has received as regards rubber trees, many of the important diseases attack the trees through the roots, travelling from one tree to another. In order to counteract this, the firm have placed their " Fungal " preparation upon the market, and were showing it at the Exhibition in order to hear the opinions of the mycologists and plant doctors visiting the Exhibition, on the efficacy of their remedy.

Messrs. Voss have already sent samples out to the various rubber-producing centres, and have been very gratified to hear from one client, that in the course of about three weeks eighteen out of the twenty-one trees treated with " Fungal " had quite recovered their appearance of health, and the gentleman who superintended the experiment, and has since returned to this country, tells us that shortly after the report was formulated the remaining three trees of the experiment also recovered, while the eighteen trees looked healthier than those that had required no treatment.

In face of this we should recommend estate owners and managers to try this material under varying conditions, so as to estimate both its powers and its limits, as we are satisfied that there is a future before it, especially as the makers are always ready and willing to collaborate with planters to help them make the preparation still more useful to themselves and their trees.

C. J. Dams & Co., Ltd.

In " Soil and Plant Sanitation," the author dwells at some length on the rapid way glass tapping cups were even then taking the place of those made of metal and other materials. One of the pioneers in

the supplying of these glass cups, if indeed they are not the actual originators of them, was Messrs. C. J. Dams & Co., Ltd., of 121, Newgate Street, London, E.C., a firm well known in the wholesale glass trade as having been established for many years, and as being suppliers of reliable goods. Seeing therefore that the firm were exhibitors at the Rubber Show, we discussed with them the advantages of the various makes of the glass tapping cups they supply. These were shown attached to a real tree, carefully painted to represent the herring-bone and other methods of tapping with cups attached to catch the latex. Their representative told us that the demand was mostly for the lemon-based cups, but that the flat-bottomed cups were also largely ordered. The facility with which the name of the estates can be indelibly cast into cups discourages theft, or enables the property to be traced and identified if missing. Glass also being non-corrosive, strong, clean, and cheap, it is not surprising that planters to-day seem inclined to give up other kinds of cups for those made of glass, and judging by the large trade they do, Messrs. Dams, Ltd., must be securing the majority of their orders.

MESSRS. JOHN YATES AND CO., LTD.

In our book on "Soil and Plant Sanitation," pp. 591-601, we dwelt fully on the tapping knives, and other tools and implements made by this firm for use on rubber and other estates, and the assortment and quality of those shown on their stand at the Rubber Exhibition left nothing to be desired. After over twenty years' experience in the hardware trade on both sides of the water, we know the prejudice of makers and storekeepers against "fads," in stocking each new pruner, rubber tapper, or cutlass, &c., brought into existence, because someone used it and liked it, and so wants everyone else to do the same. Messrs. Yates evidently are not of this ilk, they make tools for all tastes; axes and forest-clearing implements, parangs, jebong knives, changpots of every size, weight and shape, whilst their "Burgess" and other rubber-tapping knives, received special attention, and the planter or importer that cannot be pleased by them is not likely to meet what he wants elsewhere.

HAMPSON BROS., LTD., Manchester.

Although equally able to equip the largest of rubber factories, this firm showed two machines especially designed for small estates, as they specialize in these two lines. The larger of the two machines shown was an 8 × 12 in. rubber washing mill, which can be supplied with any pattern rolls, and seems a handy but strong machine. A 4 × 12 in. mill for specially small lots of rubber was also shown.

HOWARTH, ERSKINE, LTD.

This firm showed two of the well-known 12 × 16 in. B.1 type of their well-known improved design of rubber washing, sheeting, and crêpeing machines, with diamond cut rolls. The make of these machines offer something original in design, and show care for the welfare of the manipulator in placing the rolls at a somewhat sharp angle, by which they hope to facilitate and expedite the work. Their hand-power machines received careful attention from those having only small quantities of rubber to be treated at a time. The firm makes and stocks these machines at their Singapore works, and can therefore deliver promptly, besides being able to superintend the erection of the machines and the installation of complete factories from start to finish. As the machinery and everything used is of their own make, and as they are on the spot to superintend the making, transport, and erection of their machines, Messrs. Howarth, Erskine can guarantee satisfaction to those entrusting orders to their care.

We were presented with one of their catalogues, and judging from the number of estates mentioned in this as being users of the machinery made by the firm, or having placed orders with them, Messrs. Howarth, Erskine, Ltd., must be doing a very large business out in the East. Visitors were notified that the rubber machines, latex carts, &c., exhibited were made by them.

MR. A. VAN STARREX.

This well-known firm of seed exporters was the only one who exhibited at the Rubber Show. The seeds arrived somewhat late, about a week after the Exhibition opened, but when finally arranged they showed a full range of rubber and other seeds, now in constant demand from all rubber-producing centres. There is some doubt whether seeds or stumps are best to send when Hevea estates have to be planted, but as we say in connection with the Venesta exhibit, if fewer seeds were sent in Wardian cases, we believe that the results would be more satisfactory in the end. Even if stumps are ordered an attendant is often sent with them, as is the case with a lot of 50,000 Hevea stumps going to West Africa. With the Manihots it is different; these seeds will last an indefinite period, and so can, the same as Robusta coffee, be sent with safety by post. With the demand for rubber seeds and stumps just now, Messrs. Van Starrex should have secured good orders with their exhibit, as it included all varieties.

PURUB.

It gave us much pleasure to meet Professor Sandmann again, and to hear his account of how the use of purub is extending among the producing centres he has lately visited, he having just returned from an extended tour round the rubber world. He explained to us how the use of purub produced a more even, thorough and at the same time quicker coagulation of the latex, whilst at the same time acting as a preservative to the rubber treated with it.

Professor Sandmann took us to see the model factory of the Singapore Rubber Estates, Ltd., where, by the method exhibited, no metal comes into contact with the latex, wooden tubs and large shallow wooden troughs (like cacao trays) being used to collect and coagulate the latex, of course with the use of purub. The moment the latex has been poured in, and the purub added, long dividing lathes are inserted lengthways, in slots provided, and so cut up the contents into strips. Over these strips other lathes, with spaces to allow the water to escape, are placed and pressed down, so that, after coagulation has taken place, the rubber comes out in a form very handy for passing through the hand rollers close by, which turn out the strips as thin sheets about 12 in. wide, of which a number were exhibited, and showed up well for colour and strength. In the German section purub had an important exhibit, both of its well-known preparation and the rubbers treated with it.

Sugar.

The serious nature of the damage done by drought and insects in parts of Bohemia and Central Germany, reported Mr. C. Czarnikow, writing on July 6th, found a strong expression in further buying orders from abroad, where fabricants are purchasing back at higher prices what they sold, and where speculation has set in strongly, driving new crop from 10s. 5d. to 11s. 2¼d., whilst August "bears," partly against sales to consumers, covered from 11s. to 11s. 11¾d., equal to about 4.55 cents New York, whilst Java sugars can be bought at 4.15 to 4.25 cents, according to shipment. It is estimated that deliveries in June will much exceed 165,000 tons, which last week was considered a normal figure.

Meanwhile the reports from Bohemia talk of 20 to 30 per cent. damage, Moravia being normal, and Hungary better than usual. In Germany the Central provinces are supposed to have suffered in a manner similar to Bohemia, whilst nearer the Baltic and in the West rain has fallen. Licht thinks that the insect plague has abated somewhat, and that in Silesia, part of Posen and Pomerania it has almost disappeared, permanent damage having been done in a limited central area, where fine weather might make good some of the harm done, though the leaves are three weeks and the roots one week backward. Other informants, however, state that many empty spaces are appearing; the official Prussian report classifies the average aspect of beetroot fields as 3.1 (fair), against 2.5 (fair to good), last year.

Russia seems to expect a large crop from her 717,137 against 609,135 desiatines, and may have to pile up larger stocks next year. Therefore holders resolved to clear old stores as much as possible by exporting the balance of their Convention contingent of about 5 million poods, say 80,000 tons during June-August (old style), most of which will have to come to the United Kingdom. They will be welcome here because June deliveries, instigated by shipping strikes, rising prices, festivities, &c., no doubt have been abnormally large (everybody taking in a liberal supply), just as they were abnormally small last year owing to the Budget, and were then followed by heavy clearings in July. Instead of 30,000 tons excess it is just possible that we may have delivered 40,000 or even 50,000 tons excess in June, reducing visible stocks considerably, and that we may experience a moderate falling off in July.

Whether the old season in Europe will finish with stocks much different from last depends mostly on fresh charters for America, of which some more have been reported this week. As to new crop, if we put a surplus in France, Holland, Hungary, against a shortage in Bohemia, we should have a deficiency in Germany to be covered by larger shipments from Java to the United Kingdom (of which there will be a good quantity, as America may not be a buyer), and perhaps by some imports from Cuba, but at normal prices there seems to be not too much sugar. Whether 11s. 5½d. for May is too high or not remains to be seen when prospects of the crop can be better gauged. When quantities are decreased, the cost of production rises, but 11s. 3d. is considerably above average cost.

In actual sugars a good business was done at 11s. to 11s. 3d., prices then rising to 11s. 10½d., and 75 per cent. from 9s. 2¼d. to about 10s. 1½d., Tate's cubes advancing from 19s. 3d. to 20s. The American market has been firm in sympathy with European advices, and business has been done in Cuban sugars up to 4.05 cents, which is the quotation for Centrifugals = 12s. 4½d. c.i.f. for 96 per cent. Cubas = 10s. 10½d. c.i.f. for 96 per cent. Javas = 9s. 10½d. f.o.b. Hamburg for 88 per cent. net beet.

From cane-producing countries no fresh news has come to hand, but the sugar has been in good demand in the United Kingdom, and a considerable business has been done at advancing prices. Refining grades show about 6d. rise on the better grades, whilst grocery crystallized sells in moderate quantities at a similar improvement.

The total transactions of British West India for the week amount to about 6,000 bags. Crystallized Trinidad, middling yellow, sold at 15s. 3d. to 15s. 4½d. duty paid; good ditto to good yellow and pale, 15s. 6d. to 15s. 10½d. Crystallized Jamaica, low grey, realized 14s. 3d.; low middling ditto, 14s. 6d. to 14s. 9d.

Some business done in Mauritius syrups to arrive at 9s. 3d. ex. ship, and on the spot at 11s. duty paid.

2,790 bags Guatemala syrups partly sold at 11s. 3d. to 11s. 9d. duty paid.

300 pockets yellow San Salvador syrups sold at 13s. 9d. duty paid.

Up at Liverpool, 1,269 bags Mexican sold at 12s. quay telquel, to the Clyde, and about 150 tons Muscovado West India at 10s. 3d. floating, landing, basis 89 per cent.

Coffee.

By Messrs. C. M. and C. Woodhouse.

The moderate supplies of all descriptions submitted at auction during the week ending July 8th met with a good demand, and generally dearer rates were obtained. All grades up to 70s. were readily saleable at an advance and above this price, values were fully steady.

Sales include the following, viz.:—

East India.—600 bags, viz.: Neilgherry, &c., 66s. 6d. for smalls, 70s. 6d. for medium, 79s. for bold; Wynaad, 63s. 6d. to 65s. for smalls, 67s. to 67s. 6d. for middling, 69s. to 70s. for bold; Travancore, 66s. 6d. to 67s. for smalls, 68s. 6d. to 70s. for middling, 73s. to 76s. for bold; Liberian, 65s. per cwt.

Java.—83 bags at 71s. 6d. for medium greenish Mocha, 8 Frazils at 100s. 6d. for good short berry.

Mombasa.—46 bags at 64s. 6d. for smalls.

East African.—42 bags at 66s. 6d. for smalls, 68s. 6d. for middling, 72s. 6d. for bold.

Costa Rica.—1,100 bags at 67s. to 68s. 6d. for smalls, 65s. to 74s. for fine ordinary to good middling, 68s. 6d. to 82s. 6d. for fair to fine bold.

Guatemala.—340 bags, at 67s. to 69s. for low middling to middling, 69s. 6d. to 70s. for bold.

Salvador.—925 bags, at 66s. to 66s. 6d. for foxy green, 67s. 6d. to 68s. 6d. for low middling to middling, 69s. for bold.

Nicaragua.—570 bags, at 65s. 6d. for foxy green, 65s. to 66s. for smalls, 65s. 6d. to 71s. 6d. for fine ordinary to good middling, 74s. 6d. to 80s. 6d. for good to fine bold.

Cotton.

THE following were the prices for Cotton in London on July 6th, according to Messrs. Slann and Davies :—

	Good Fair.	Good.	Fine.	Superfine.	Compare Good 1910.	Compare Good 1909.	
	d. d.	d. d.	d. d.	d.	d. d.	d. d.	
Surat kinds* ...	$6\frac{13}{16}$ to $6\frac{29}{32}$	$7\frac{1}{16}$ to $7\frac{1}{4}$	$7\frac{5}{16}$ to $7\frac{9}{16}$	—	$6\frac{1}{8}$ to $6\frac{5}{8}$	$5\frac{5}{16}$ to $5\frac{3}{4}$	per lb.
Madras	$7\frac{1}{16}$ to $7\frac{3}{16}$	$6\frac{11}{16}$ to $7\frac{7}{16}$	—	—	6 to $6\frac{15}{16}$	$5\frac{1}{16}$ to $5\frac{13}{16}$	—
Bengal	—	$6\frac{3}{8}$	$6\frac{5}{8}$	$6\frac{3}{4}$	$5\frac{3}{8}$	$4\frac{13}{16}$	—
Assam	—	$6\frac{5}{8}$	$6\frac{7}{8}$	—	6	$5\frac{1}{4}$	—
China	—	$6\frac{1}{2}$	$6\frac{3}{4}$	7	6	5	—
West Indian ...	$8\frac{3}{8}$	$8\frac{7}{8}$	$9\frac{3}{8}$	$9\frac{5}{8}$	$8\frac{3}{4}$	$6\frac{1}{8}$	—
Sea Island ...	12	14	17	20	17	$9\frac{1}{4}$	—
West African ...	$7\frac{5}{16}$	$7\frac{7}{8}$	$8\frac{1}{8}$	—	$7\frac{9}{16}$	—	—
East ,, ...	$7\frac{13}{16}$	$8\frac{5}{8}$	$10\frac{1}{4}$	—	$8\frac{5}{8}$	—	—

* Liverpool quotations.

The market opened quietly this week (ending July 8th) and soon lost a few points, but since the 3rd there has been a distinctly improved Spot demand, and the quotation for Middling after falling from 8·11d. to 7·93d. has recovered to 8·08d. The Agricultural Bureau Report, issued 3rd inst., gave the condition as 88·2, which was about what was expected, and which compared with 87·8 last month and 80·7 last year. "Futures" at noon to-day were well up to last Thursday's rates, but towards the close there was a sharp fall on reports of good rains in Texas, and this brought prices 9 to 2 below them. East Indian is still neglected.

The import into Liverpool this week amounted to 20,328 bales, since September 1st 4,204,043, same week last year 18,014, last year's total 2,972,686 bales. The estimated Sales amounted to 45,000 bales, including "called." Middling American is quoted at 8·08d. per lb., last year 7·89d., 1909, 6·59d.

Movement of American Cotton since September 1st :—

	1910-11.	1909-10.	1908-09.
Brought into sight	11,459,000	10,142,000	13,353,000
Exports from United States since September 1st—			
To Great Britain	3,270,000	2,319,000	3,448,000
To Continent, &c.	3,920,000	3,445,000	4,505,000
Total crop	—	—	13,825,000

The latest quotations of Americans for delivery, basis middling, any port, G.O.C. :—

	July 6th. d.	Last Week. d.	Last Year. d.
July	7·71½	7·81	7·53½
July—Aug.	7·69	7·77	7·44
Aug.—Sept.	7·44	7·49	7·17

The India-rubber Market.

By Messrs. S. FIGGIS AND Co.

THE Pará market displayed increased strength, lasting during the early days of the week ending July 15th, business having been done in hard fine up to 4s. 11d., an advance of 8d. per lb. Subsequently a reaction set in, with rapid fluctuations, and prices fell away nearly 6d., but a steady tone was noticeable at the close and values finish about 3d. dearer than a week ago. A fairly good business has been done in hard fine, spot and near closing 4s. 5½d. value. Caucho ball sold at 3s. 9d. to 4s. for f.a.q.

The moderate supplies of plantation at the auctions, which commenced on July 11th and concluded on the 13th, consisted of 254 tons Malaya and 46 tons Ceylon.

At the opening there was an active demand, which continued through the first day, and prices, in sympathy with the upward movement in Pará, advanced sharply, showing on the day 8d. to 1s. rise on the previous sale, dark crêpes and smoked sheets showing the greater advance. The second day's result was less satisfactory, the drop in Pará causing prices to give way 4d. to 6d., and the demand was less active. On Wednesday (the second day) also, prices were affected by the weakness of Pará and a further decline took place, the final result showing an average advance on the previous sales' rates of about 4d. per lb. Prices realized included :—

Plantation Malay.—Sheets, fair to fine smoked, 5s. 1½d. to 5s. 9¼d.; partly smoked, 4s. 6d. to 5s. 4¼d; fair to fine unsmoked, 4s. 11¾d. to 5s. 8½d.; damp, mouldy, and pressed, 4s. 6d. to 5s. 3¼d. Crêpe, fair, fine, pale, and good palish, 4s. 11¾d. to 5s. 9¼d.; light brown and grey, part streaky, 4s. 9d. to 5s. 5¾d.; clean brown, 4s. 6¼d. to 5s. 2½d.; dark brown, part specky, 3s. 10¾d. to 5s. 1d.; black and soft, 3s. 0½d. to 4s. 9¾d.; smoked good, 4s. 9¾d. to 5s. 5d. Scrap and virgin, fair to fine, 3s. 10d. to 4s. 8d.; mixed and inferior, 2s. 6d. to 3s. 4d. Rambong, crêpe, 4s. 6½d.; sheet, 4s. 2½d.; scrap, 3s. to 4s. Castilloa, good pressed block and sheet, 3s. 8d. to 4s. 3d.

Ceylon.—Sheets and biscuits, fair to fine, 5s. 1½d. to 5s. 9d.; damp and pressed, 4s. 6d. to 5s. 5d.; Ceará, 4s. 6d. to 5s. Crêpe, thick, fair to fine, 5s. 1¾d. to 5s. 9d.; fair to fine, and good palish, 5s. to 5s. 8½d.; light brown, 4s. 10d. to 5s. 4¼d.; dark brown, 3s. 9d. to 5s. 2d.; black and soft, 3s. to 4s. 3½d.; smoked, 4s. 10½d. to 5s. 5¼d. Scrap and cuttings, fair to fine, 3s. 11d. to 4s. 6½d.; mixed and inferior, 2s. to 3s. 4¼d.

Mozambique, Zanzibar.—Good sausage, 3s. 10d. to 4s. 0¼d.; pressed strips, 3s. 6d.; loaded sandy sausage, 2s. 10½d.; Manihot, soft slab, 2s. 11¾d.; good block, 3s. 7½d.; brown crêpe, 4s. 0¼d.

Assam.—Plantation red block, 4s.; good red scrap, 3s. 6¾d.; heated and sandy pickings, 2s. to 2s. 6d.

Malaysian.—Sold cheaply, dark brown and black soft crêpe, 2s. 4¼d. to 2s. 5½d.

Tea.

By Messrs. Wm. Jas. and Hy. Thompson.

Offerings during the past week, ending July 8th, have only been moderate, and we can quote a steady although somewhat featureless market. Among Indian teas the better selection of the new crop insured their receiving careful attention, and improved quality was quickly noted and appreciated. Ceylons, apart from fluctuations in price, consequent upon irregularities in quality, have sold with a steady tone.

A good selection of new Indian teas were eagerly competed for by all sections of the trade, and attractive invoices from all districts sold well. The teas from Assam included one or two invoices with very useful quality, which were picked out and competed for. Darjeelings again received careful attention and any showing improved flavour were very well received, export orders for the leaf grades being plentiful. Southern India teas were well represented and realized their value, although some of the teas showed a slight falling off in quality and appearance. The Calcutta bought and secondhand teas show little change and may be quoted fairly steady. The following are the best averages realized on the 3rd inst: Darjeeling-Goomtee, 1s.; Phoobsering, 10¾d.; Ambootia, Ging and Tukdah, 10½d.; Castleton, 10¼d. Assam-Sealkotee, 9¼d.; Chubwa, 9d. The average of the sale was 9d. per lb., against 8d. per lb. a year ago.

The Ceylon market is steady to firm, bidding being brisk and well distributed. Quality is somewhat irregular, some of the lower-grown teas being very indifferent, while among medium invoices improvements are not infrequently to be found. Prices naturally appear to be rather irregular also, but, taking difference in quality into consideration, the results of the sale should be satisfactory to sellers. The highest averages made were: Delmar, 9¾d.; Cranley, 9¾d.; Dunsinane and Portmore, 9½d. The average of the sale on Estate Account was 8⅜d. per lb., against 7¾d. per lb. last year.

The London Cocoa Market.

By The Editor.

Although in the six months deliveries for home consumption in the United Kingdom are now only 587 tons behind 1909, and 240 tons in excess of last year, I am somewhat disappointed to see that the June deliveries for the whole of the United Kingdom were not better. Now that the question of the Budget and possible changes in the duty were settled in May, I did hope that June would have shown what our makers can do in the way of deliveries without fiscal matters to keep them back. In June only 1,930 tons were delivered for consumption in the United Kingdom, against 1,714 tons last year, and 1,225 tons in 1909; whilst for the six months the figures work out as under:—

Raw cocoa only—	Landed.	Del'd. H.C.	Export.	Stock (June 30th)
Jan.-June, 1909—	21,126	12,187	3,036	10,904 tons
,, ,, 1910—	16,815	11,360	3,512	10,674 ,,
,, ,, 1911—	20,494	11,601	2,956	15,587 ,,
	Incr. 3,679	Incr. 241	Decr. 556	Incr. 4,913 ,,

The comparative deliveries for consumption at the chief centres, according to the latest figures, are as follows:—

Jan.-May—	1911.	1910.	1909.	
Germany ...	22,103	19,026	17,586	tons (English).
France	10,733	9,650	9,305	,, ,,
U.K.	9,671	9,646	10,962	,, ,,
Holland	9,360	6,218	5,528	,, ,,
	51,867	44,540	43,381	,, ,,
Four months—				
Add U.S.A. ...	27,686	18,088	26,037	,, ,,
Comp. Totals	79,553	62,628	69,418	,, ,,

Meanwhile the market on the whole remains firm though quiet, and sales of attractive lots have been made throughout the month at the prices given later on. Although the Havre stock can still well be described as enormous (286,600 bags), it is nearly 14,000 bags less than it was at the end of May. On the other hand the stock of San Thomé at Lisbon is comparatively speaking, as low as the Havre, and also the London stocks are high. At the end of June the Lisbon stock was 86,958 bags, against 132,637 bags last year. The movements and values at Havre were returned by Mons. Anthime Alleaume as being as follows at the end of June:—

Havre, June 30th.—	Landed. June only. Bags.	Del'd. June only. Bags.	Stock. 1911. Bags.	Value. Fcs.	Stock. 1910. Bags.	Value. Fcs.
Pará ...	7,848	3,047	19,209	67 to 70	21,096	65 to 70
Bahia ...	1,917	6,771	33,076	61 ,, 69	20,893	60 ,, 65
Venezuela ...	9,038	9,941	40,556	68 ,, 160	52,728	66 ,, 145
Trinidad ...	3,310	2,907	50,473	69 ,, 72	49,929	66 ,, 69
Grenada and other W.I.	653	1,028	5,616	61 ,, 68	6,990	59 ,, 67
San Thomé...	731	3,320	24,676	65 ,, 67	12,799	64 ,, 66
San Domingo	3,306	2,727	5,540	59 ,, 64	11,245	55 ,, 60
Haiti ...	324	1,556	15,333	51 ,, 66	19,498	49 ,, 62
Accra ...	1,565	8,080	52,279	60 ,, 64	22,088	57 ,, 60
Guayaquil ...	1,199	1,898	14,469	71 ,, 80	7,155	72 ,, 84
Others ...	961	3,210	25,366	—	28,116	—
Totals ...	30,852	44,485	286,593		252,537	bags
In 1910 ...	47,075	35,212		In 1909	188,625	,,

Against this the London stock on July 8th was:—

	1911. Bags.	Value s.	1910. Bags.	Value s.
Trinidad ...	7,273	57 to 65	10,399	54 to 62
Grenada ...	16,909	50 ,, 56	14,433	48 ,, 53
Other W.I. ...	7,601	48 ,, 55·6	5,602	47 ,, 53
Brit. W. Africa	6,300	49 ,, 53	5,309	45 ,, 50
Port. W. Africa	7,347	53 ,, 55	739	50 ,, 52
Germ. W. Africa	6,514	52 ,, 54·6	40	50 ,, 52
Ceylon and Java	18,556	59 ,, 85	22,449	56 ,, 70
Guayaquil ...	39,348	54 ,, 63	18,214	61 ,, 69
Brazil and Bahia	2,032	51 ,, 56	1,311	50 ,, 53
Other Foreign ...	11,808		10,889	
Totals ...	123,688		89,385	bags

In London the fall in the value of Guayaquils seems more pronounced than at Havre. In other growths it is interesting to note that, although stocks both at London and Havre are so much heavier than last year, values generally have risen, especially in Gold Coast kinds.

Coming to the producing side, Guayaquil, Bahia, and the Gold Coast show heavy increases, whilst Trinidad, Grenada, and San Thomé are somewhat behind, say:—

Producing Figures—	1911.	1910.	1909.	
Guayaquil (Jan.-June) ...	448,700	377,800	417,300	qtls.
Bahia (Jan.-May)... ...	223,464	126,779	106,753	bags
Ceylon (Jan.-Mid-June) ...	46,614	44,387	32,376	cwt.
St. Thomé (Lisbon) (Jan.-June)	260,670	289,020	226,781	bags
Gold Coast (Jan.-May) ...	16,624	10,673	8·042	tons (Eng.)
San Domingo (Jan.-May)	6,016	4,971	2,483	,,
Oct 1st-June 26th—	1910-11	1909-10	1908-09	
Trinidad	218,439	241,454	230,892	bags
Grenada	61,814	69,669	63,477	,,

As to business done, Guayaquils are not easy to dispose of, and the market for these is quiet if steady. Fine Ceylons, when offered, sell well. Trinidads continue to sell with more facility and show rather higher values, whilst with Grenadas, and "Other W.I.," both these good points, from the producer's point of view, are even more marked, especially lower grades; whilst those having Gold Coast kinds for sale, either in London, up at Liverpool, or at Havre, have nothing to complain of, unless they are hard to please, and at the moment of going to press, the Liverpool market generally seems firm.

Including the sales on July 18th, prices rule as follows:—

Trinidads.—Good to fine marks, 58s. to 60s.; superior, 63s.; mid. red, 57s. 6d.

Grenadas.—Common unfermented to fair fermented, 51s. to 52s. 6d.; good red marks, 54s. to 55s.; fine, 56s. to 57s. 6d.

Dominicas.—Good to fine marks, 53s. to 55s. 6d.; fine, 56s. and 56s. 6d.; ordinary unfermented to fair, 48s. to 52s.

Jamaicas.—Fair to good red marks, 53s. to 56s.; one lot of fine, 59s. 6d.; common to fair, 49s. to 52s.

St. Lucia.—Fine, up to 57s. 6d.; common kinds, down to 49s. or 50s.; fair to good red, 52s. to 55s.

Costa Rica.—Good red sold at the end of June at 62s. to 63s.; bold, 73s.; fair to good middling red, 52s. to 53s.

German West African.—Good red, last sold at 54s.

Surinam.—Good red, 55s.

British West African.—Fair sold at 49s.; good red is valued at 50s. to 54s.

East African (Tanga).—Good boldish is valued at 70s. (67s. 6d. bid); fair boldish, valued at 62s., had 58s. 6d. bid.

San Thomé is now valued at 54s. to 56s.; 52s. was bid in sale for some, but seemed at least 2s. too low.

Bahias, in face of the rise in Grenadas, are now worth about 52s. to 53s. for fair, up to 56s. to 58s. for superior.

Mauritius.—A few bags good fermented realized 67s. 6d.

Venezuelan.—Fine clayed sold at 100s.; unclayed from 70s. for fair up to 83s. for good boldish.

Guayaquil.—Arriba is valued up to something over 60s. for good Arriba, and sales are reported at 64s. for fine; Fine Caraquez sold at 59s.; fair at 55s.; Manta, at 55s.; and Machala, 55s. 6d. to 56s.

Ceylon remains firm and tends higher for fine; but there has been none on offer; good medium sold from 66s. to 70s.; bold, up to 75s. 6d.; fair, at 62s. to 65s. Common "Native" sold at 42s. 6d. to 46s.

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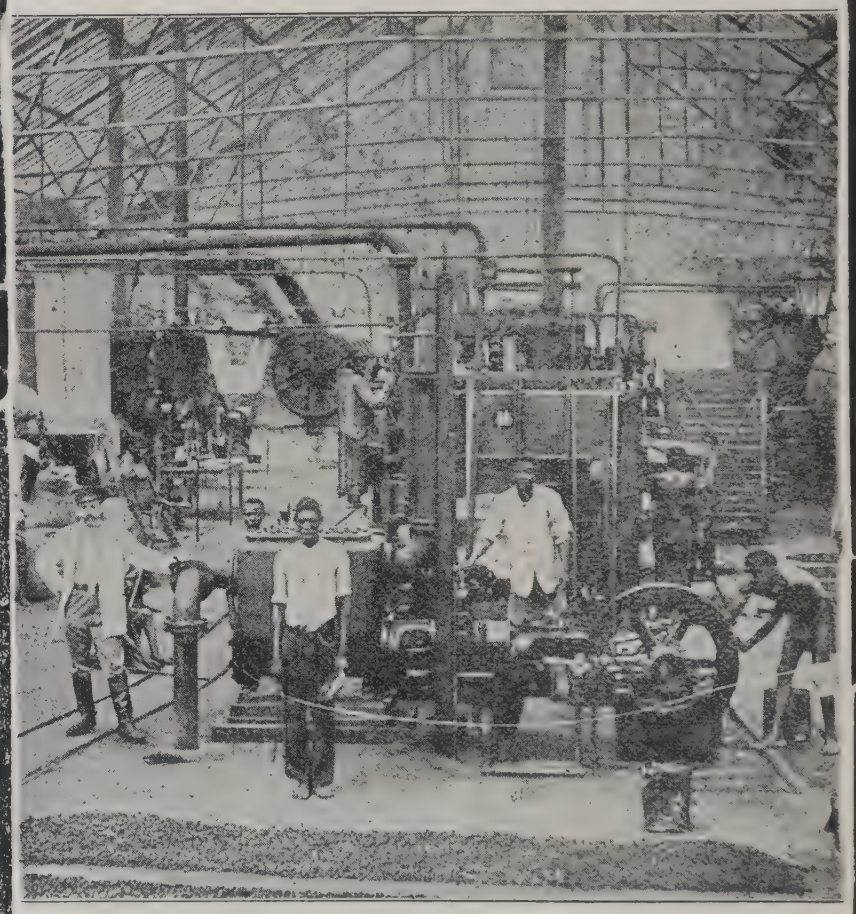

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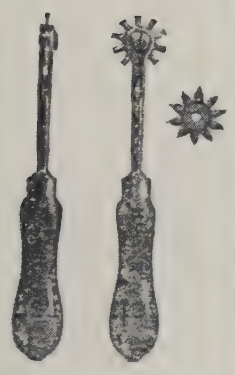

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The Evils of De-forestation.

A WARNING TO OUR OWN COLONIES.

THE evils of de-forestation, and the indifference of governments or local authorities as to how the lands under their control are opened up, by felling the timber and clearing the woods and forests, is exemplified by Paris. Last year, when we were preparing our "Notes on Soil and Plant Sanitation," we commented on the floods which were then carrying dismay and destruction throughout the gay (?) city, owing to the Seine having risen to an uncontrollable height. This year, on August 1st, the newspapers reported that the other extreme had been reached, for the water supply had fallen so low that the poor people were scooping water from the gutters, whilst the well-to-do were using soda-water for washing purposes. Had the lands and especially the hills in the upper reaches of the Seine or her tributaries not been denuded of the trees, regardless of after-consequences, the supplies of water reaching the river, before it enters Paris, would have been more equalized. Instead of running over the surface of the bare land as they now do, the rains, percolating through the foliage of the trees, would have had time to sink into the ground, and so reach the springs which feed the rivers by degrees, and thus cause the water to take weeks and months to reach Paris, instead of only days and hours, as is now the case. If therefore Paris, or other centres in France (and many of our own tropical and other colonies will do well to take warning and, by bearing this in mind, benefit by others' misfortunes), wish to avoid floods on the one hand or the expense of having to use soda-water to wash with on the other, they must see that regulations are issued regarding the felling of timber, or clearing of the land around the sources of supply, even if they have to buy up certain areas to do so. Where already too late to save the trees, they must replant the land, and leave the trees to grow up again. Costly as this may be, the Parisians or anyone placed in the predicament that they are, would do well to follow our suggestion, as by doing so they will save money in the end, and certainly suffer far less from an excessive supply of water one year or evils of a famine the next.

Another lesson to be learnt from Paris is the burning effect of water upon trees. "Along the Seine," the *Daily Telegraph* tells us, "all the trees are burnt up as if they had been singed by a flame. This in itself is no exceptional phenomenon, as this amazing summer has dried up all the foliage in Paris, and the trees have shed yellow and brown leaves as if we were already well on in autumn. But there is one peculiarity about the condition of the embankment trees. Their leaves are burnt not so much on the upper

surface as underneath. The explanation given of this circumstance is remarkable. Trustworthy observation has proved that the river wavelets act as mirrors, which reflect the sun's rays upwards. Light and heat are thus projected continuously upon the under surface of the leaves and burn it."

Review.

CANE SUGAR. A textbook on the Agriculture of the Sugar-cane, the Manufacture of Cane Sugar, and the Analysis of Sugar House Products, together with a chapter on the Fermentation of Molasses, by Nöel Deerr, Sugar Technologist at the Experiment Station of the Hawaiian Sugar Planters' Association, and Author of "Sugar and the Sugar Cane." xvi+ 592 pp. Royal 8vo. 280 illustrations. Price 20s. net, 22s. post free. Norman Rodger Altrincham (Manchester), or TROPICAL LIFE, Publishing Dept., London. By A. Gordon Howitt, B.Sc.

There is no more fascinating study of any economic question than that relating to the sugar industry. From the time of the English settlement in the West Indies up to the beginning of the 19th century the world's sugar supply was obtained from these islands, and in consequence the planters amassed large sums of money. The first blow at this flourishing industry was struck in 1807 by the abolition of slavery, since this curtailed the supply of cheap labour, but a greater calamity happened when Napoleon, as a brilliant example of retaliation, prohibited the importation of British cane sugar into any continental port. At that time the French flag could be found all over Europe, and the real question at issue was to find another supply of sugar, since the supplies from the French Colonies, such as Mauritius, were effectively shut off by the British Fleet. Experiments in the laboratory had revealed the fact that about 6 per cent. of sugar could be obtained from sugar-beet, and Napoleon, quick to foresee the importance of this discovery, offered high rewards with the object of fostering the production of sugar from beet. As long as the Napoleonic wars continued, the sugar-beet industry flourished under this system of protection, but when peace was declared and European ports were again open to West Indian cane-sugar, the former industry underwent a period of decline. The remaining part of the history is a tribute to scientific research work in the laboratory and on the experimental field. Of course, one must not forget that the imposition of high import taxes on cane sugar by European Governments gave a tremendous impetus to beet-sugar production, but the real and lasting benefit may be traced to the increase in the percentage of sugar in the beet by seed selection, cultivation, and manuring.

Now it would seem as if the sugar planters had also wakened up to the possibilities of the sugar-cane industry, and the way to this has been made much easier by the abolition of the "Bounty system." Before us lies a text-book extending nearly to 600 pages, and this, a perfect mine of information, deals with every branch of the cane industry from the selection of a suitable variety to the handling of the raw product. Mr. Deerr is, however, a technical chemist and the soundest part of the book is naturally to be found where he discusses the technical details, the machinery and the various chemical processes such as the "Carbonation Process." In that part dealing with the cultivation of the cane, and especially in those two chapters dealing with the soil and the manuring of the cane, the author shows himself, if I may be permitted to say so, to be too much of a chemist and gives in great detail the chemical analyses of the plant ash and of the soils in the various sugar-growing districts. Recent experiments have shown that the chemical analysis of a soil has no direct bearing on the suitability of that area for any particular crop, and even the citric-acid test gives no direct information as to the availability of the plant foods in the soil. Chemists tell us, for instance, that if a soil shows a percentage of potash over .01 determined in a 1 per cent. solution of citric acid, then there is very little need for the application of artificial potash manures to that soil. In giving this statement they overlook not only the many other factors which make up the fertility of the soil, but also the "ranging" powers of the roots of the various crops, *e.g.*, the deep roots of wheat as compared with the shallow roots of barley. And the fallacy of the statement becomes more evident when we consider what .01 per cent. really means. The apparent density of average soils is a little over 1.0, and taking the weight of a cubic foot of water at 62½ lb., the weight of soil calculated to a depth of one foot gives roughly 3,000,000 lb. per acre. Now, .01 per cent. of this is equal to 300 lb. per acre, and even this is a considerable amount, or as much as would be contained in fully 5 cwt. of muriate of potash. Yet experiments have proved over and over again that the addition of say 1 to 2 cwt. of artificial potash manures to these soils has given not only an increase, but a profitable increase over the unmanured and incompletely manured plots. There still exists in the minds of many planters the idea that the chemical analyses of soils are the best guides to the manuring of crops, and chemists, by using ever such weak dissolving agents as citric acid, have attempted to separate the "readily available" plant foods from the "unavailable," but a little consideration ought to convince one of the uselessness of this division, since solubility is purely a question of degree and not of kind. Before leaving this part we have to add that the reader must go over these chapters very carefully in order to sift out the really important points. One feels that a summary ought to have been given at the end of each, for statements and counter-statements follow each other, and the main facts are obscured by the repetitions and conflicting observations.

To give an adequate idea of the scope of this book would require a whole issue of TROPICAL LIFE, but in conclusion it may be pointed out that the planter, the botanist, or the technical chemist who is in need of a book for reference to serve as an encyclopedia on sugar-cane in all its various phases cannot do better than invest in this latest publication.

Yellow Fever and its Prevention, by (the late) Sir Rubert Boyce, F.R.S., with 61 illustrations, 380 pp., including 20 pp. of Index. London: John Murray, Albemarle Street, W. Price 10s. 6d. net.

Being a nuisance, especially a dangerous nuisance, is certainly a short cut to notoriety. Thanks to its having this quality, the *Stegomyia* mosquito promises to become as famous as the importunate widow, and like her, not because of its deserts, but because of its insistence. The fact that this insect, and its attendant evil, yellow fever, has caused so eminent a scientist as Sir Rubert Boyce to devote three substantial volumes* to make it famous, shows how serious a pest it is to white residents. Whilst we believe that, some day, the last three books of Professor Boyce could with advantage be condensed into a single volume, it is perhaps as well at this stage of our knowledge and investigations into tropical diseases, their causes and cures, to be overdone with details rather than run the risk of missing one or two points connected with the most recent investigations, and in the volume under review the West Coast of Africa is rather more fully dealt with than before. What we should like to see carried out are experiments with insecticides, or other fluids (like Izal, for instance), to see whether, whilst every precaution is taken to stamp out the disease and exterminate the *S. fasciata* and its larvæ by mixing such preparations with the water, the rigid notifications and laws now recommended are so absolutely necessary. It certainly would be an interesting experiment—one, too, in which our chemical and disinfectant manufacturers would take the keenest interest in, to the benefit of the public as well as themselves.

In the present work, chapter xii, on the treatment of yellow fever, cannot be too closely studied. It contains many important hints and instructions, not only from Sir Rubert Boyce, but also by men who are resident in fever-stricken tropical areas. There is, we are told, no specific drug that is of any use. The treatment for a possible cure can be summed up in an insistence on the patient being screened, and on him or her having absolute rest. From the time of feeling unwell the patient must be put under mosquito netting and forbidden to sit up or even to move to pass water, &c. Absolute rest to the organs, as well as to the muscles, is necessary if the best chance, often the only chance, is to be given to the patient. Like Professor Boyce's previous works, "Yellow Fever and its Prevention" should be on the bookshelf of every tropical doctor, and many laymen would also be well advised to secure a copy and study it carefully. There is much that he will be able to understand and appreciate in it, and, in common with all Sir Rubert's works, it is a most interesting book to read.

* Actually five books, "Yellow Fever Prophylaxis in New Orleans," "Yellow Fever in Honduras," "Mosquito or Man?" (see Tropical Life, December, 1909, p. 194), "Health in the West Indies" (Tropical Life, April, 1910, p. 76), and now "Yellow Fever and its Prevention."

West Africa Coming into its Own.

West Africa, like other places, wants to be known to be understood; those who have taken the trouble to know and understand her find that she is prodigal with her gifts, and if hard at times on those who make light of her climate, gives freely to others who treat her with respect and prove themselves deserving of wealth and influence.

Among those who have made a careful study of our West African possessions, Mr. Gerald C. Dudgeon stands out prominently. Thanks to the knowledge, practical and theoretical, obtained as Director of Agriculture in Egypt, when appointed Inspector of Agriculture for British West Africa, Mr. Dudgeon brought his experience and training to bear on the new work with results, we understand, that have given satisfaction to all sides.

This experience, we are glad to see, has been put into book form, as one of the Imperial Institute Handbooks, under the title of "The Agricultural and Forest Products of British West Africa,"* and as Professor Dunstan says, in his preface, Mr. Dudgeon has written with an unrivalled knowledge of his subject, and gives a comprehensive account of the vegetable products of that country, which will afford to the general reader some idea of the enormous possibilities of this British territory now in the process of rapid commercial and agricultural development.

The book gives a general account of the chief economic products, indigenous or introduced, to be met with in British West Africa, rubber, cacao, palm-oil, cotton, &c., as cultivated and prepared in each of the five divisions, viz., the Gambia, Sierra Leone, Gold Coast, Southern and Northern Nigeria. A map and some forty photographs complete the work, which we do not hesitate to commend to the notice of those interested in administrative, commercial, or agricultural work on the Coast. For prospective officials—since to know and be able to rule West Africa you must be acquainted with her agriculture—the book will be specially useful.

For the year, January-December, 1910, according to the *Revista Azucarera*, of Buenos Aires, the total crop of sugar in the Argentine Republic was as follows:—

	Tons of 1.000 kos.
State of Tucuman...	119,162
,, Jujuy	21,447
,, Salta	1,120
,, Santa Fé	2,200
,, Corrientes	330
,, El Chaco	3,962
,, Formosa	623
Total ...	148,844

* Price 5s. net. John Murray, 50A, Albemarle Street, London, W., or, Tropical Life Publishing Department. These handbooks are issued under the authority of the Secretary of State for the Colonies, and edited by Professor Wyndham Dunstan, M.A., LL.D., F.R.S., Director of the Imperial Institute, and President of the International Association of Tropical Agriculture. Professor Wyndham, it will be remembered, wrote the introduction to our last book, "Notes on Soil and Plant Sanitation on Cacao and Rubber Estates," when he dwelt on the necessity of training young men to take charge of estates in the Tropics.

Tropical Products in British East Africa.*

IN his annual report for 1910 the Director of Agriculture for the British East African Protectorate gives due prominence to the growing exports, and considers that those of beans, coffee, maize and millet are worthy of special note.

With the development of ostrich farming and the increase in the flocks of woolled sheep the export of ostrich feathers and wool shows a steady advance. In 1907-08 the value of rubber exported was Rs. 29,049 (Rs.=1s. 4d.), and this has risen to Rs. 225,791 in 1909-10. This export is almost entirely of native rubber, as most of the acreage under Ceará has not yet reached the tappable stage.† Groundnuts and sem-sem are being taken up more largely by the natives, especially in the Kisumu Province. The two notable decreases in the exports are coprah and wax. The reasons assigned to the falling off in the export of coprah are the tapping of the coco-nut palms for tembo, the ravages of the coco-nut beetle, and the good prices received for whole nuts.

The actual figures of the principal articles of export for the past year are as follows, each item showing an appreciable increase on the previous year: Beans Rs. 31,233, coffee Rs. 16,012, cotton Rs. 63,863, coprah Rs. 175,562, fibres Rs. 90,754, ivory Rs. 373,133, maize Rs. 46,740, ostrich feathers Rs. 6,335, rubber Rs. 225,791, sem-sem Rs. 232,037, and wool Rs. 20,507. In the imports it is interesting to note that no less than Rs. 220,324 worth of sheep were imported last year, being an increase of 100 per cent. on the previous year's sheep import. Those interested in maize should note the following figures:—

Cost of Preparation, Planting, and Cultivation per Acre.

	Rs.	
Ploughing	1·88	
Planting	·34	
1 Harrowing	·17	
3 Scufflings at ·75...	2·25	
Seed 10 lb.	·37	
Rent	·12	
Sundries	·75	
Take low average crop at 5 bags ...	5·88	
Cost to produce	1·18	per bag.
Reaping, &c., per bag	·36	
Cribbing, collecting, and carting ...	·27	
Shelling	·12	
Sack...	·42	
	1·17	per bag.
Reaping, shelling, &c.	1·17	,,
Growing	1·18	,,
	2·35	,,
Delivery to station	·20	
	2·55	,,
Cost of 200 lb. maize F.O.R. Rs. ..	2·55 = 3	,,

The cultivation of cocoa promises to be among the most valuable tropical products for selected areas in the Mazeras and Rabai districts, as well as other favoured parts of the coast. Plants established at the farm in May, 1909, are now 2 ft. high and are healthy. Six acres of selected land have been planted with bananas, 12 ft. apart each way, for temporary shade for the young cocoa plants, and permanent shade trees of Madura (*Gliricidia maculata*) from the West Indies have been established at intervals apart of about 60 ft. Holes 2 ft. wide and the same in depth were dug and filled up with humus and good surface soil so as to ensure the plants getting a good start and preventing the tap root striking hard soil, which is detrimental to its growth. Through the courtesy of Mr. R. N. Lyne, Director of Agriculture, a consignment of cocoa pods was received from Zanzibar in the early part of the current year and have proved a valuable auxiliary to the plants obtained from Ceylon. An arrangement has been made between the Director of Agriculture and Mr. Lyne for further consignments of cocoa pods during 1910, so that a sufficiency of plants will in another year be available for extended trial in other selected parts of the Protectorate.

One and a half acres of sugar cane were planted in May, the method of cultivation being that known in the West Indies as "cross holing." The plants used were a "transparent" or Bourbon type from Kibos, and a local "striped ribbon" variety. The season proved excellent for growth, the canes attaining a good length with long internodes. Sugar cane growing to supply the local demand for sugar offers a sound investment for one or two factories.

* Extracted from *The Leader*, of Nairobi, B.E.A.

† In our November (1910) issue we show illustrations of Ceará rubber growing in B.E.A.

The Cultivation of Cacao, No. XXIII.

By A. GORDON HOWITT, B.Sc.

IN the April issue of TROPICAL LIFE interesting figures are given (page 69) on the experiments conducted by Professor Wohltmann in the Cameroon district of West Africa, and these may be supplemented by extracts taken from a small pamphlet issued last year on the manuring question in the German colonies.

Professor Wohltmann has conducted numerous investigations on the composition of the soil in the Cameroon district, and as a result that district which lies on the southern and western slopes of the Cameroon mountains was regarded as particularly suitable for the cultivation of the cacao tree. In this district of Victoria cacao trees have been planted, and for a time the yields justified the conclusions arrived at by Professor Wohltmann. Gradually, however, the trees seemed to lose their former vigour, and to have become susceptible to fungi disease, which in their weakened state they were unable to throw off. As nothing in the way of cultivation or manuring had been attempted, manuring experiments were then arranged on these older plantations so as to ascertain the influence of manures, not only on the yields of the trees, but also on their resistance to these fungi blights which cause so much damage in cacao plantations.

The plan of manuring and the yields from each plot have already been given in the April issue, and so for our purpose it is sufficient to quote the results from the unmanured and the fully-manured plots.

		Green Cacao Beans.	Dry Beans.
Unmanured		3.67 lb.	1.45 lb.
Fully manured { Kainit ... 2.2lbs. / Superphos. 1lb. / Am. Sulphate ½lb. }	Per tree.	13.49 ,,	5.32 ,,

An interesting calculation has been made to show the profit from each tree by such manurial treatment.

Cost of the manures per tree.

2·2 lb. Kainit	220 lb. Kainit cost 7·8s. + transport charges of 3·9s.	1·4 pence.
1 lb. Superphosphates	220 lb. Superphosphates cost 9·8s. + transport charges of 3·9s.	0·8 ,,
½ lb. Sulphate of Ammonia ...	220 lb. cost 32·2s. + transport charges of 3·9s.	1·0 ,,
	Total cost	3·2 ,,

The yield from one tree on this plot amounted to		5·32 lb. Dry Beans.
,, ,, ,, ,,	the unmanured plot amounted to ...	1·45 ,, ,, ,,
	Difference in favour of manure	3·87 ,,

Taking the price of cacao beans at 1s. per 2·2 lb.,

This gives a return of	20·6 pence.
Cost of manures is	3·2 ,,
Profit	17·4 ,,

The profit from each tree by such treatment thus amounts to about 1s. 6d. Such a favourable result ought to extend and stimulate the interest in manuring experiments on cacao plantations, for the problem as to the most economical means of manuring can only be discovered by such practical tests as carried out in this experiment.

Another interesting experiment on cacao culture has been carried out in the Idenau Plantation, Cameroon, West Africa. This experiment was commenced in March, 1907, and plots of 50 trees, each seven years old, were selected and manured in the following way:—

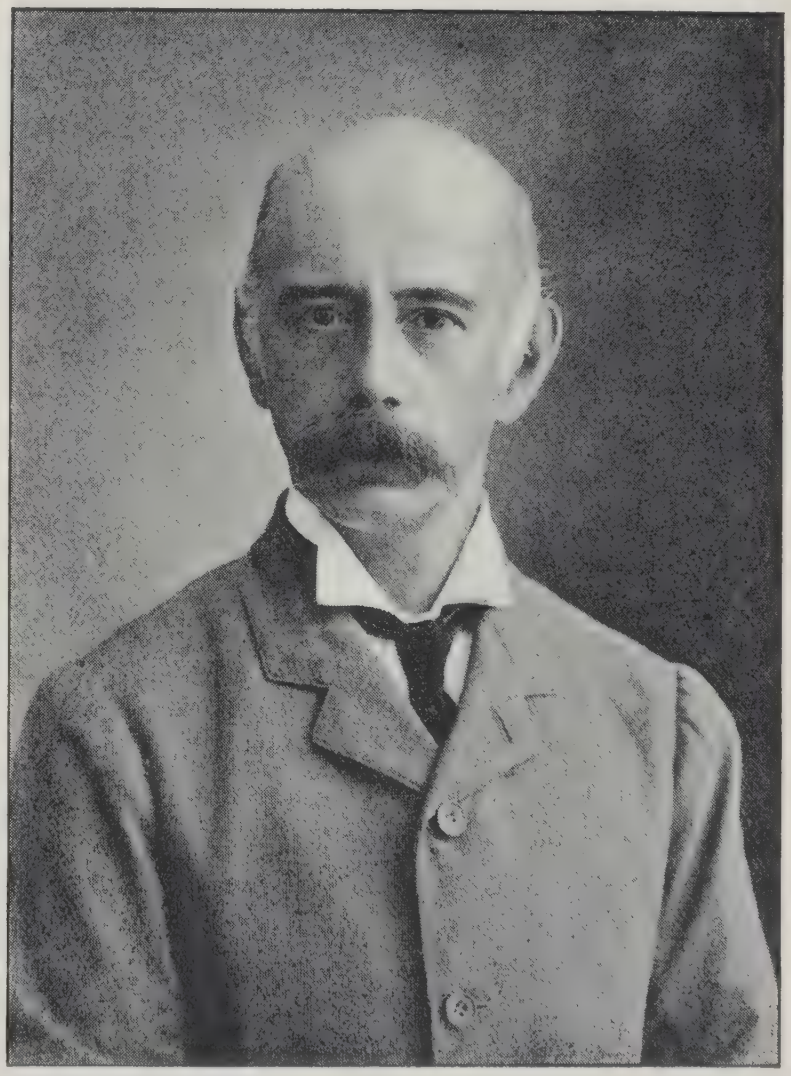
1.—No manure. 2.—Muriate of Potash, ½ lb.; Basic slag, 1¾ lb.; Sulphate of Ammonia, ½ lb. 3.—The same as 2 without Potash. 4.—The same as 2 without Phosphate. 5.—The same as 2 without Nitrogen.

During the growth of the trees the benefit of the application of these artificial manures was easily recognized in the greener foliage and the larger number of fine strong young shoots—this in spite of the fact that the soil of the "No manure" plot was, judging by previous results, of better quality than that of the other plots. The yields from each plot were carefully harvested in 1907 and 1908, and the produce from a single tree, with a calculation to show the gain or loss from each tree by such manurial treatment, is as follows:—

Plot	Cost in pence Manure per tree	Yield per tree 1907	Yield per tree 1908	Total	Gain or loss	Value of increase in pence	Nett Gain
		lbs.	lbs.	lbs.	lbs.		
I.	—	2·01	2·30	4·31	—	—	—
II.	2·41	2·55	2·62	5·17	+ 0·86	4·54	2·13
III.	1·82	2·07	2·00	4·07	— 0·24	loss	— 3·17 loss
IV.	1·47	2·31	2·36	4·67	+ 0.36	1.9	0·43
V.	1·53	2·33	2·38	4·71	+ 0·40	2·08	0·55

Seldom has a manuring experiment given such convincing proof of the value of a complete fertilizer containing in proper proportion the three essential plant-foods, nitrogen, phosphate, and potash. In the first year the "No potash" plot gave a slightly increased yield over the "No manure" plot, and in the second year the return was actually less, whilst over the two years the yield has not been sufficient to pay the cost of the manures. It is only by such experiments that the planter can become thoroughly intimate with the character of the soil he has to deal with, and from the results so obtained there is no doubt that the yield from every plantation could be substantially increased. Of course it must be admitted that such experimental work requires much care and trouble, and it does not always happen that the results are so clearly defined as in this case, for one has always the outward influences to take into account, and changes in the weather often have adverse effects on the value of experimental plots.

A Belated Recognition of Good Work.



Mr. H. N. Ridley, C.M.G., F.R.S., &c.

The time and space required for the report of the rubber exhibition published last month prevented us from congratulating the East Indies on the very tardy recognition of its work in tropical agriculture, by the Government on this side bestowing the C.M.G. on Mr. H. N. Ridley, F.R.S., &c., Director of the Botanic Gardens at Singapore, and the only comment

we have to make on the honour is that it should have been conferred long ago. No one, the West Indies least of all, will deny that useful and far-reaching as the work done by the botanic departments "out West" has been, the East has more than held its own, yet Professor Harrison, of British Guiana, received his C.M.G. longer ago than we can remember, certainly long enough for the K. to have been added by now. Dr. Francis Watts was made one in 1904, and Sir Daniel Morris in 1893, and K.C.M.G. ten years later. Compared to this, the East, personified by Mr. Ridley, the "Grand Old Man of Singapore," as *Grenier's Rubber News* very happily style him ("old," of course, being only a term of affection, for, as our photograph shows, Mr. Ridley is "na vera auld," and not more bald than we are), has had to wait until this year of grace, 1911, for his recognition, and there are still others, Col. Prain, at Kew, and Mr. Kelway Bamber, for instance; Dr. Harold Mann, up at Poona, and many more, for the East Indies covers a slightly larger area than the West.

By the number of *Grenier's News* referred to above, we learn with great regret that Mr. Ridley is shortly retiring from the directorship of the Botanic Department at Singapore. In our issue of January, 1907, we had the pleasure of including Mr. Ridley as "Our Friend," when we gave particulars of his career up to that date. Since then, of course, we have had the rubber boom, when a man who towers so far above everyone else as regards knowledge of rubber planting, as Mr. Ridley does, could have rivalled Mr. Keith Arbuthnot himself as regards money making, instead of which he, as the Director of Agriculture, stuck to his last, giving the world the benefit of his experience for them to make money instead. All agree that the East will lose a valuable friend when Mr. Ridley retires.

Tropical Manuring.

THE following table is from a very interesting article on fertilizers by Mr. J. C. Brünnich in the *Queensland Agricultural Journal*, October, 1910:—

APPROXIMATE MANURIAL REQUIREMENTS OF VARIOUS CROPS IN LB. PER ACRE:—

Crop.	Nitrogen.	Phosphoric acid.	Potash.	Lime.
Bananas	30— 60	50—80	30—160	56
Beans	0— 27	20—56	75—130	70
Citrus Fruit ...	40— 80	30—40	40— 80	40
Corn	20— 80	20—53	50—110	30
Cotton	20— 30	30—60	15— 30	70
Lucerne or Alfalfa	0— 10	40—70	65—100	140
Onions	60— 81	20—36	50— 80	56
Peas	0— 13	20—56	56—100	70
Pineapples... ...	50— 75	50—75	100—150	70
Potatoes	20— 53	20—50	67—100	30
Rape	50— 70	40—70	60— 80	80
Sisal Hemp ...	10— 20	20—40	50— 70	50
Sorghum	30—100	30—60	70—150	30
Sugar-cane ...	30— 80	20—60	50—100	50
Tobacco	50—140	50—90	80—150	70
Tomatoes	30— 50	15—20	50— 80	30
Turnips	90—112	20—33	100—150	80
Wheat	10— 40	15—56	20— 65	30

Cacao and Rubber in Grenada.

SATISFACTORY as Grenada's cacao shipments have been this crop (1910-11), the total exports are behind last year (65,058 bags, against 72,093 bags last crop and 66,512 bags for 1908-9) and seem unlikely to catch up. Some of the planters, however, especially those who have done well on their estates, still believe that the total may yet pull up to last year's level. Those estates that have maintained their previous record have done so only on account of the high standard of work maintained and the intensive cultivation carried out. For one thing, a very large quantity of manure was imported again into the colony, the planters recognizing that their present high standard of yield per tree can only be maintained by the continuous use of manures. Evidently excess of rains do not always adversely affect the output, since the last two or three years have been rather "soppy" ones, and yet, as already shown, the output, particularly of the 1909-10 crop, has been good. This year seems to have given a much better dry season from the planter's point of view.

It may be news to some to know that Grenada has also got the rubber-planting fever. Although we have never noticed any mention of the complaint in the Government's reports, Mr. Malins Smith tells us that quite a lot of planting is being done, and that the island can already boast possession of a fair number both of Hevea and Castilloa trees of two and three years old. An order was recently sent to Ceylon for 50,000 Hevea seeds for the various planters in Grenada, besides which some thousands of seeds have been planted from local trees or imported from Trinidad. As we never believe in placing all the eggs in one basket, we are glad to hear that Grenada is going in quite as seriously for rubber as she has for cacao.

THROUGH the courtesy of Mr. Takekuma Okada, M.A., Secretary of the Yokohama Chamber of Commerce, we have received a copy of the seventh annual report of that body for 1910, which contains some interesting statistics in face of the economic upheaval going on in that country. The exports and imports are exhaustively dealt with, as are also the bullion movements, then comes a very interesting section devoted to the price of foodstuffs, for a number of years, on the one hand, and of the wages paid to artizans and labourers on the other. Very full figures, covering some 140 pages, are given of the shipping traffic of the port.

Plantation Rubber Packing.—So many parcels are now arriving *matted together*, which leaves the sheet too damp and mouldy, and prejudices the selling value, as such rubber does not pass as F.A.Q., that we recommend all sheet being packed flat in the cases, and not *rolled*. If too long for the case, let the rubber be cut to proper lengths, or carefully turned over so as to pack flat. The cases must be well made and free from splinters and sawdust. This is why "Venesta" cases are coming into general use. "In the Malay Peninsula," reported Dr. Cramer, for instance, in his 1910 report, "I saw nothing but "Venesta" cases being used."

The Production of Synthetic Rubber.

FOR a considerable number of years chemists have known that by taking natural rubber $\{(C_{10}H_{16})n\}$, and distilling it, they could obtain isoprene (C_5H_8), which could be reconverted into rubber which was chemically pure, but the cost of doing so was prohibitive.

Later, Sir William Tilden discovered, that by passing turpentine (Pinene $C_{10}H_{16}$) through an iron tube heated to a dull red heat, he obtained a small quantity of isoprene (about 4 per cent.) after passing the turpentine through various times. This isoprene could be polymerised to rubber, but the cost was such that it could not be made commercially.

The process owned by the Caoutchouc Syndicate, Limited, is based on much the same lines as those of Sir William Tilden, but instead of passing the turpentine through an iron tube, it is passed through a tube containing certain catalytes which enable the manufacturers to use a much lower temperature, and consequently obtain a very much larger percentage of isoprene, as it was found that at the higher temperature a great proportion of the isoprene was destroyed.

This isoprene, having been purified, is polymerised by a special patented method (British Patent, No. 14,041, A.D. 1910, 24,237, A.D. 1910) and is subjected to heat at a constant temperature in an autoclave for a certain number of hours.

The converted isoprene is then treated with steam to recover certain valuable oils formed at the same time, the rubber being precipitated. The rubber thus obtained is then dried, rolled and sheeted, and becomes a crêpe of the highest quality.

In this process only the crudest and cheapest turpentine is used, and in addition to the rubber, there are obtained so many other valuable bye-products—such as essential oils, benzenes and toluenes free from sulphur, that the manufacturers are said to have claimed that the cost of manufacturing their rubber does not exceed 6d. to 8d. per lb.

The process was fully demonstrated in public at the International Rubber Exhibition on July 10, in the presence, and under the control of the following well-known experts and chemists appointed by the press and scientific committees of the exhibition:—Dr. Esch (Hamburg); Dr. Torrey (U.S.A. Rubber Co.); Dr. Stevens and Dr. Beadle (Analytical Chemists): Dr. Mote (Rubber and Gutta Percha expert, Silvertown Rubber Co.); Dr. F. Frank (Henriques' Laboratory, Berlin); Mr. H. F. Gardner, F.C.S.; whilst the following representatives of the press were present: *India Rubber Journal*, *India Rubber World*, *India Rubber Review*, *Grenier's Review*, *Gummi Zeitung*, *Gummi Markt*, and TROPICAL LIFE.

The *India Rubber World*, of New York, have issued a very comprehensive account of the London Rubber Exhibition as their August number; this included thirty-two photographs of those who took a leading part at the Agricultural Hall, as well as of the six chief trophies and other photographs. The whole makes up a publication that is well worth securing by anyone interested in rubber.

The Cult of the Coco-nut—No. XIV.

CUBA will no doubt be able to hold her own as a coco-nut producing centre, and more than her own when capital is turned towards her. Great possibilities are certainly there if made proper use of, and care taken to keep the coco-nut bud disease under. If the Cubans wish to make money, they must, the same as others, work for it, not spasmodically, but steadily and continuously. At present, the *Cuba Review* tells us, the only region where coco-nuts are now grown for export is at Baracoa, where, in spite of bud-disease, some $135,000 worth of nuts were exported last year. Meanwhile the Commission appointed by President Gomez to examine and report on the disease started work a few weeks ago. "Since the disease," writes O. W. Barrett, "in the Philippines, appears to attack only the 'heart' of the crown, the symptoms are very readily noticeable in the dying or yellowing of the leaves, and the dropping of the fruits. As soon as these symptoms can be recognized as coming from this particular disease the planter should lose no time in felling the tree and in destroying the bud and leaves thereof." If buried, at least 18, and better still 24 in. of good soil, not leaves and rubbish, should cover the foliage, and great care must be taken not to drag the diseased portions along the ground. The only means of combating the disease is to check its spread, and with attention this can be done before its germs can mature and be transmitted to the surrounding trees.

In his Farmers' Bulletin, No. 17, on coco-nut culture (Bureau of Agriculture, Manila, Philippine Islands) just to hand, Mr. Barrett includes useful information and instructive illustrations of the rearing, harvesting, and preparation of coco-nuts and coco-nut products. His first photograph of a typical plantation at La Laguna, shows at a glance, by the closeness of the trees, why the production on some, and most of the estates there, is so small.

In the matter of drying the coprah, of which the Philippines now claim to be producing about one-third* of the world's total crop (and this percentage is likely to increase in the near future), we are warned that it is highly advisable that steps should be taken at once toward the general adoption of artificial dryers in place of the present methods of sun-drying and smoking over the "*tapahan*."

The disadvantages of the sun-drying process points out Mr. Barrett, are: It can only be used during the dry seasons, which in most parts of the Philippines are of more or less uncertain duration: the time required is excessive from an economic standpoint, and the drying is not sufficiently rapid† to prevent decay in the coprah from nuts that are more or less immature when picked.‡

The disadvantages of the sun-drying process are:—the creosote and other substances carried in the smoke

* The present crop is valued at P. 20,000,000, but with proper cultural methods it is calculated that the same area could easily export P. 25,000,000 (P. 1 = 1 yen or 2s. 0½d).

† We give detailed reasons for this in our May issue, page 95.

‡ The nuts of course should not be unripe, at the same time as with the cacao planters in Bahia, the Philippines must, in the end, adopt mechanical dryers.

from the husks and shells permeate the entire mass of the coprah meat, thus rendering it unfit for the higher purposes for which the unsmoked article may serve, such as butter, edible oil, &c.; the drying is always more or less uneven, some of the pieces being scorched while others are scarcely half dried at the time of removal; moulding and decay, while *en route* in bags, is very likely to result from the half-dried coprah pieces which are always sure to begin to decay within a few days after their removal from the *tapahan*. Against these the advantages of the modern artificial methods are: the absolutely smokeless quality of the unfinished product; the small amount of time required for turning out a completely dried article; the far better keeping qualities on board ship, or in store; the very superior appearance of the artificially-dried material, its freedom from mould, dirt, &c.; all of which are almost always to be found in the sun-dried product.

Mr. Barrett, in common with all leading experts of to-day, tells us to plant wide; and the manner in which he writes on this subject betokens that he would like the palms planted even wider than the spaces he gives, but is weaning the planters from their close distances by degrees. Unless, he urges, at least 8 metres (1 metre—39.37 in.) or 26 ft. 3 in., is allowed between the rows, the yield is seriously affected, and it is believed that the yield of many plantations in the Philippine Isles is fully 50 per cent. below normal, due largely to excessive close planting, and on alluvial soil the space should be increased to 10 metres, or just upon 35 ft. In the Philippines the quincunx system is commonly used, *i.e.*, each tree is set opposite the interspaces of the adjacent rows on either side of it; this allows each tree a little more room than does the square planting. The following plan is recommended as the best, especially for large plantations on level lands: Blocks of four trees are set at 8 metres apart, and around this block extends a space 10 metres wide; in other words, the rows alternate 8 and 10 metres in each direction. This, it is claimed, induces a slight leaning of the tree, which facilitates climbing; it also leaves partially open a considerable space which may be planted with beans and other crops, especially during the first eight or ten years. In good alluvial soil a well-grown palm should begin to flower during its fourth or fifth year, but the average bearing age of the Philippine palms as a whole is probably not less than eight years, and in many cases twelve. The delay, however, seems avoidable, as it is due to the poisoning effects of cogon roots and lack of ventilation. No details are given of the annual crop of fruits per palm.

According to Consular reports prices for coprah in Zanzibar in 1910 ranged between 4s. 6d. (the lowest for indifferent quality) and 8s. 7d. (the highest price for good quality of coprah) per frasila of 35 lb. Local prices do not fluctuate according to the output of the season, but move in sympathy with the European market. With the exception of small exports to Germany and Bombay in 1909 and to Italy and Germany in 1911, the shipments from Zanzibar apparently were made entirely to Marseilles.

Meanwhile coco-nut products on August 12th were valued as follows:—

Coprah firm. Manila August-September, £23 17s. 6d. buyers. Cebu August-October £24 15s. value. Java August-September £25 10s. value Northern Ports nett. South Sea Islands August-September £24 7s. Continent August-September £24 5s. value London. Malabar August-October £27 value. Ceylon August-September £26 sellers Northern Ports. F.M.S. Straits August-September £25 10s. Northern Ports and F.M. ditto £24 12s. 6d. value Marseilles, all c.f. and i., delivered weight.

Cocoanut Oil dearer. Ceylon spot £40, August-September £38 10s. c.i.f., September-November £38 5s. c.i.f., October-December £38 c.i.f. Cochin spot £42, August-September £39 10s. c.i.f., September-October £39 10s. c.i.f.

Cocoanut Cakes in good demand at higher value. London made: Oblong £6 17s. 6d., round £6 15s. per ton ex works London.

The Drying of Maize for Export.

ACCORDING to the first number of *The Agricultural Journal*, of Cia de Moçambique, whose presence in the arena of tropical agricultural journalism we cordially welcome, maize, like all other vegetable matter, can never be *absolutely* dry unless dried by artificial means, and the question arises, what is meant by "sufficiently dry"? and to show what is meant by "sufficiently dry," the Mozambique journal quotes Mr. J. Burtt-Davy, F.L.S., from the *Transvaal Agricultural Journal*, for April, as follows:—

"Maize may contain from 12.5 to 13.5 per cent. of moisture on arrival in London, and yet remain perfectly sweet. But, as it may gain from 1.5 to 3 per cent. moisture in transit, it should not contain more than 12 per cent. moisture when it leaves our ports. Samples containing 12.7 per cent. were slightly damaged on arrival, but this appears to have been due to contact with wetter bags, for they gained 1.7 per cent. moisture in transit, bringing the moisture content up to 14.4 per cent. Sound dry samples of Transvaal maize may contain as low as 11.5 per cent. of moisture on arrival at Durban; but on exposure to the atmosphere on the Durban wharf, for only a week, they may gain from 3 to 3.5 per cent. moisture, which is sufficient to bring them up to the danger-point for export. Maize containing 16 per cent. moisture does not absorb much (.02 to .36 per cent.) in transit, but dry maize, containing only 12.7 per cent. moisture, may absorb up to 1.7 per cent. on the voyage from Durban to London. We must therefore conclude that 12 per cent. is about the maximum moisture content that can be permitted for safe shipment, but it would be much safer to ship sound maize with only 9.5 per cent. moisture on leaving South Africa."

THE cotton crop produced in the Uganda Protectorate during the past season amounted to over 6,000 bales, and it is estimated that the crop which is now being picked will produce from 8,000 to 10,000 bales. A good deal of the cotton is being baled by the hydraulic press sent out by the B.C.G.A., and in this manner a considerable saving is effected in freight charges.

The Centrifugal Separation of Rubber Latex.

The "Smith family" has been equally noted for the number of its members, as well as for the leading positions some of them have filled, and often well filled, in the management of the affairs of the world, political, naval, commercial, and planting.

The latest addition to the number of those who have become well known, at least in rubber planting circles, is Mr. Harry S. Smith, of Caledonia Estate, Tobago, who recently issued a very useful report on Castilloa rubber planting in Mexico (see Tropical Life for April, pp. 65, 66), and who has invented a machine for separating the rubber globules in latex by centrifugal force. This interesting machine was on show at the Exhibition, and caused more than one discussion among the visitors as to whether separation and coagulation were one and the same thing.

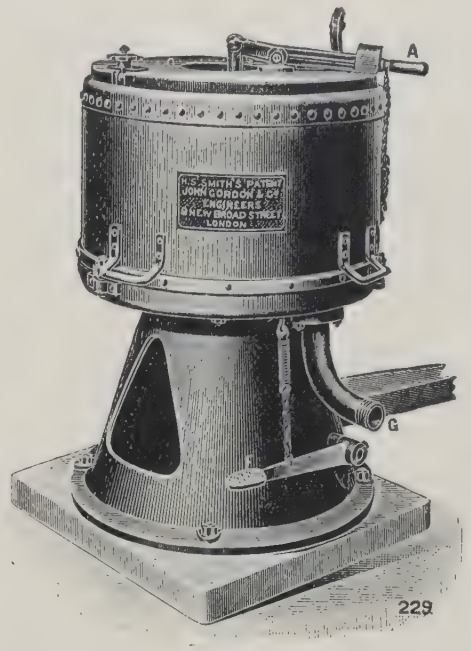
Two members of the Smith family soon found each other at the Exhibition, viz., the inventor of the machine above mentioned, and the Editor of this paper. The inventor referred to the query raised by the Editor some years ago as to the possibilities of centrifugal machines in rubber dairies at the lecture delivered by Mr. Herbert Wright before the "Society of Arts." In those days experiments or ideas were confined to throwing the latex against cloth, with the idea that the water (as with sugar making) would go through, and the rubber be left behind. It was found, however, that where the water could pass so could the caoutchouc globules, especially those of Hevea latex, which are smaller than Castilloa.

Mr. Harry S. Smith claims, however, to have overcome this difficulty by obtaining a complete separation before any liquid is allowed to escape or the rubber globules to reach the screen or cloth.

A water-tight metal drum is used with an opening at the top, and valves are fitted to the outer wall which can be opened and shut during the rotation of the drum to allow the separated liquid to escape. A removable inner lining placed inside the drum receives the sheet of separated rubber on the liquid being thrown out, and after being separated the lining with the rubber attached is lifted out and another lining dropped in its place.

On the rotation of the drum at a high speed (1,600 rev.), enough water is put in to cover the screen and prevent the unseparated globules driving against and clogging the screen. The latex is now run in and under the centrifugal action the lighter rubber globules are forced out of the mother liquid and a wall of rubber is built up on the face of the wall of liquid; in about five minutes a complete separation will take place (if at this stage the drum is stopped, the separated rubber will be seen floating in the liquid like so much broken sheet ice, showing how complete the separation is); the valves are now opened, and as the liquid escapes the wall of separated rubber is deposited on the removable lining, and with the valves open the rubber is dried in the way that wool clothes, &c., are dried in an ordinary hydro, by continuing to run the machine for a few minutes longer.

With Castilloa, when first taken out, the rubber is short and crumbly, showing that it is only separated, and not coagulated; the latter stage follows immediately on handling the rubber by pressing it between the finger and thumb; in practice the screen only requires to be put into the curing room for a day, when coagulation takes place naturally and the sheet of rubber is stripped from the screen.



The "Harry S. Smith" Machine for separating rubber globules in latex by centrifugal force.

The net result obtained is a sheet of rubber 5 ft. long by 1 ft. broad (the circumference and depth of the drum), and of varying thickness, according to the latex introduced, but $\frac{1}{4}$ to $\frac{3}{8}$ in. attracted our attention as being best, whilst the resultant rubber is well prepared, strong in texture, resilient and nervy to the grip, smooth and even to the touch. So far as appearances go, *i.e.*, outside of scientific investigations, the rubber produced from Castilloa latex, as Hon. Archer Warner stated at the West Indian dinner, compared favourably with Pará sheets, and could well be taken for it, especially if, when fresh from the drum, it were hung up to be smoke-dried. It seems to us, therefore, that another member of the Smith family has achieved fame on account of his enterprise and perseverance in research and observation work. We can only hope that profit as well as fame will equally fall to his lot over this invention.

Hevea latex requires a coagulant to obtain a separation and with a little acetic or formic acid added a complete separation and coagulation was obtained at public demonstrations at the Rubber Exhibition.

Funtumia was also demonstrated with; in this case no preservative was added on sending the latex from the Gold Coast, and a complete separation and coagulation was obtained by using hot water without any chemicals.

It is curious to note that although the separation of *Castilloa latex* by centrifugal force is such a simple matter, its chemical coagulation without the application of heat has proved most difficult, and the only coagulant that Mr. Smith has been successful with in the machine is an extract from the Moon Vine (*Ipomœa Bona Nox*) so generally used in Mexico and Central America for this purpose.

"Tropical Life" Friend.—No. 74.

CUTHBERT CHRISTY, M.B., C.M.(Edin.), &c.

Author of "The African Rubber Industry and Funtumia elastica"; "Mosquitoes and Malaria"; "The Birds of San Domingo," &c.

"OUR FRIEND" this month is typical of the readers of TROPICAL LIFE, he has travelled extensively, read widely, and written exhaustively on those subjects in which he has been specially interested. His most recent publication on "The African Rubber Industry," is a book which will occupy a leading place in the literature of the tropical world, particularly where West Africa is concerned.

After his school career, which was passed at Scarborough, Dr. Christy became articled to Messrs. Samuelson and Co., agricultural engineers, of Banbury, and it was this firm who enabled him, after going through their drawing office and shops, to make his first trip abroad, sending him in 1884 to the Argentine in charge of a quantity of machinery. From this centre he visited Rio Negro, Santa Fé, and Paraguay.

Returning home in 1886 he matriculated at Edinburgh University in the same year, becoming junior Mackenzie Bursar in Anatomy in 1887, and senior in 1888. He was afterwards appointed Assistant Demonstrator in Pathology, finally taking his degree in 1892. After graduating he was assistant to Sir Halliday Croom, and House Physician to the Edinburgh Royal Maternity Hospital; 1896 saw him in San Domingo in the West Indies, where, we believe, he practised for two years, leaving to join General Sir Frederick Lugard's pioneer force in Northern Nigeria as Senior Medical Officer for three years, during which time he took part in several engagements, afterwards receiving the West African medal and clasp. In 1900, Dr. Christy's energies were transferred to India as special medical officer for plague under the Indian Government, and later Acting Civil Surgeon at Ahmednuggar, 1900; Satara, 1901; after which he travelled in the Punjaub, Cashmere, Baluchistan, and Sind. Much of his time during this period was occupied in the study of malaria, and his book on "Mosquitoes and Malaria," the first edition of which was written and published in India, was the first book on the subject after Major Ronald Ross's epoch-making discovery of the mischief-making connection between the two.

Dr. Christy has been trained in a good school for one wishing to take a prominent place amongst tropical scientists, covering, as such a career is bound to do, medicine, agriculture, botany, and zoology, to which in his case has been added a knowledge of engineering, and more recently that of surveying. Probably no one has travelled over a wider range of Tropical Africa than Dr. Christy, but from the last chat we had with him it seems that he is anxious to extend that range and hopes to leave again shortly for the West Coast. He was present at the annual dinner of the West African Association (see photograph in TROPICAL LIFE for April, p. 64), when we had a long conversation with him on the future prospects of that region.

It was his visit to the Congo in 1903 as a member of King Leopold's Sleeping Sickness Commission sent out by the Liverpool School of Tropical Medicine, to which "Our Friend" was then attached as Assistant Lecturer, that first turned his attention to African rubbers, and having once been attracted to the subject he has taken up the study of the different species, particularly of *Funtumia elastica*, with the same scientific zest and thoroughness as he has displayed in other branches of tropical science, even visiting French Congo to make a special study of the conditions to be found there. For two years Dr. Christy was engaged in exploring the forests of Uganda and East Africa, visiting also German East Africa, Eastern Congo, &c. Subsequently (1906) he accepted the post of Administrator and Technical Advisor to the Mabira Forest (Uganda) Rubber Co., Ltd., and set to work with Mr. William Grant, C.M.G., as manager and a staff of assistants to develop that Company's extensive property. Before resigning the post in 1909 he devised a successful method of tapping the Funtumia rubber trees without injuring them, and discovered the best methods, which do not appear to have since been improved upon, of coagulating the latex, about which very little was known previously. The knowledge thus gained in Uganda is the basis of Dr. Christy's last book, but the chapters on the cultivation of Funtumia and much of what he has written on tapping and yields are, however, the results of information obtained and experiments carried out during 1909-10 by "Our Friend" in the German Cameroons, Southern Nigeria, the Gold Coast, and Ashanti, and elsewhere. Dr. Christy is known as an enthusiastic naturalist as well as a keen sportsman. As he is still a comparatively young man and an indefatigable worker, we are confident that the many publications which have already placed him in the front rank of tropical scientists will be largely added to in the future.

Business Notices.

1.—The address of Tropical Life is Messrs. Bale, Sons and Danielsson, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All **literary communications** should be addressed **to the Editor,** and accompanied by the necessary stamps for their return if not accepted.

3.—All **business communications and payments**, either for subscriptions or advertisements, should be sent **to the Publishers** of Tropical Life. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is **Ten Shillings** per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed to the Manager of the Department.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

August, 1911.

Put not your Trust—in Rubber Speculations.

Rubber Trusts as gambling concerns never appealed to us; for one thing we have no money of our own to lose, and not having the good fortune to be a director, we have not the chance of losing other people's. What we chiefly object to in these speculative trusts, however, is that as they seem to be run, the shareholders cannot expect to do well with them, and so get out of temper with anything to do with tropical investments, say harsh things that the Tropics do not deserve, and then leave them severely alone, to go and lose their money elsewhere. All this is hard on the Tropics, for, if well understood and properly handled, they will give substantial dividends to those who have patience, *and do not expect to get rich as a result of other people's work.* If they persist in doing so, they will come in time to learn that the workers, and not themselves, can alone be the gainers.

All this is undoubtedly due to crass idleness. Having invested their money in a rubber trust, or a gold mine, the public neglect to study the produce and how it is obtained, but leave this for others to do. This was more than proved by the attendance at the recent rubber exhibition when, we feel sure, not one per cent. of those who have their money locked up in rubber shares, took the trouble to attend, and then they wonder that they do not become rich. The marvel is that they remain as comfortably off as they are. It shows that with all the harsh things said of them, the directors are not so bad as some unsuccessful speculators wish to make out.

At the same time, very caustic remarks are made at the policy of the directors at times, and in the case of the second annual meeting of the Eastern International Trust* (Mr. de Bois Maclaren, Chairman of the Company, in the chair), according to the report in the *Financial Times*, "a somewhat curious situation was created. Very strong opposition was manifested to the proposal of the Directors to call up the remaining 10s. on the shares, and so make them fully paid, and finally it was arranged that matters should remain as they are for about three months, and that the decision should be left to the shareholders whether the call should be made or the Company liquidated and the assets distributed."

During the course of their remarks two of the shareholders clearly showed how disappointed they were that their hopes had not been realized. A Mr. Moore, of Worcester, in the course of a long speech, said that "without imputing any unworthy motive to their directors, it was contrary to human nature for them to form a clear and unbiassed judgment on the advantage of a proposition put before them when their interests as a seller were so incomparably greater than their interests as a buyer. *Truth* put this matter in a nutshell when it said that under the present arrangement the Rubber Estates Agency secured the promoters' profits, while the Eastern Trust got the underwriters' risk"; whilst a Mr. H. E. Tovey said† "that most of the shareholders had received, and probably read with interest, the circular letter addressed by Mr. Moore to his fellow-shareholders. They might have had to rub their eyes in astonishment before they could believe that a body of directors, who posed as experts in the world of rubber, claimed special knowledge of the industry and exceptional ability to employ capital in sound, progressive, moderately capitalised plantation companies, could in the short space of two years have brought the company into such a disappointing position as was now disclosed. They had listened to stereotyped platitudes about the prevailing adverse market conditions, but was there anyone who had studied rubber who had expected for a moment that the prices reached by raw rubber in the spring of 1910 would endure? The market value of the article to-day was satisfactory to those producing companies which were properly managed, favourably situated for the growing of rubber, and properly financed. Did this definition apply to all, or nearly all, the companies in which the funds of this Trust were invested? They held sixteen lots coming from the Rubber Estates Agency, and eleven of these were at a discount. The shareholders were paying the gentlemen sitting at the directors' table some thousands of pounds to find investments which had depreciated £91,000 from their cost price, and which left this Company nearly £47,000 of liabilities or contingent liabilities to deal with."

Take another Trust, the British North Borneo

* In the prospectus the following were given as Directors, &c.: Mr. W. F. de Bois Maclaren (chairman), Mr. Ernest Corfield Bucknall, Mr. Frank Copeman, The Hon. Everard Feilding, Mr. Howard Bradley Figgis, Mr. Alfred Grisar, Mr. F. J. C. L. Poisson, Mr. Percy Kilner Read and Technical Adviser, Mr. Herbert Wright.

† We are quoting again from the *Financial Times*.

Trust, which even the most critical agreed had a very strong and respected Board.* Here, again, the report was disappointing, but, as one of the shareholders said, considering that the directors seemed to have devoted all their time and money in speculating, or, to use a softer word, in investing in shares, the wonder was that they had not done worse. These remarks referred to an estimated depreciation in the Trust's investments on June 30th of £18,208. What the present value is, still remains to be ascertained by the shareholders who, in answer to their demands, were told the full list could be seen at the office of the Company.

All these discussions between directors and shareholders, however, do not alter the ultimate prospects of these various rubber trusts, which, coming out, as they did, on or after a booming market, obtained so much money that they invested it more or less badly, simply because the directors were paid to do something for their salaries and had to do it. Pushing aside as libellous any such suggestions as the main objects of the trusts being to take over the shares of those in power at boom prices, we maintain that the public deliberately place their directors in a very false position, and deserve all they get in the way of losses if they continue to insist that the directors are only there to make them rich without their (the shareholders) having to do anything to help beyond paying for their shares, and giving the directors from £100 to £500 a year as their salary. The fact is, as stated by one shareholder at the Borneo Trust meeting, and evidently approved of by others, the public will not wait, as reasonable business men investing their all have to do, from four to seven years for the substantial profits that can be looked for, and do come from carefully managed estates. They refuse to use part of the capital to open up and develop the tropics on sound commercial lines, which will in the course of time give them assured and increasing dividends, but expect immediate profits out of what can only be classified as pure speculation, and urge on their directors to buy shares in companies at ten, twenty, and fifty times the cost of what they would have to pay in a few years if they would only agree to start at the beginning and plant up themselves. If "Pataling," a public company with all its promotion expenses and sellers' profits to be added, can pay 325 per cent. dividend in a year, Selangor 375 per cent., Vallambrosa 250 per cent.,† surely companies planted up by those who claim to be leading experts can yield dividends that are worth waiting four or five years for, instead of forcing the directors to compete as speculators against those who probably spend more time in studying or rigging the market in one month than the united board of all the Trust Companies do in a year. Pitted against other planting experts as producers, many of the directors or their technical advisers should be able to do well, but pitted against the Jews on the Stock Exchange, or those who have been trained for years under them, we at least shall not be surprised nor grumble at the directors if they come off second best; on the contrary, were we one of them, we should lay the blame on the shareholders for being too impatient. Five or ten years soon pass, and those trusts which can hang on for even five years will do well to follow our advice, and, instead of placing all their eggs in the one basket of speculation with its many holes, to invest at least 50 per cent. of their capital in planting up fresh lands from the start unsaddled by middlemen's profits, promotion expenses, or speculators' losses.

* Viz., The Earl of Verulam (chairman), Sir John Jardine, K.C.I.E., M.P., Mr. E. H. Parry, Col. Ivor Philipps, D.S.O., M.P., Sir West Ridgeway, G.C.B., &c., Mr. H. M. Simons, Mr. John Turner.

† For a list of rubber companies paying over 50 per cent. dividend see TROPICAL LIFE for June, p. 117.

The Coming Boom in Coco-nuts.

WHO WILL LOOK AFTER THE ESTATES?

WHATEVER differences of opinion may exist in London to-day as to the future of the £50,000,000 that have been actually paid-up to now for planting rubber in the East and elsewhere, and whether, when the top price drops to 3s. per lb., or lower, Brazilian and indigenous rubber will be left behind, there seems no difference of opinion as to our being on the eve of an active coco-nut boom.

This was particularly noticeable at the Rubber Exhibition. Interested and absorbed as visitors were in the Exhibition, time and again conversations about rubber prospects and possibilities would stop short, and be switched right on to coco-nuts. The idea one gathers from this sudden change is that since the public will swallow no more rubber promotions and still has plenty of money to invest, a new outlet must be found for them to do so. Coco-nuts certainly offer a very favourable opportunity, since there is an insatiable demand for the oil, and, given favourable circumstances, the prices obtainable either for coprah or oil, even if the area is considerably increased, will leave a substantial margin of profit, since the cost of lands suitable for coco-nut planting is low; that is to say, the prime cost, apart from promotors and boom profits, should be low, and, on the conservative basis of forty-eight trees to the acre and forty nuts to the tree, 2,000,000 nuts in round figures can be looked for from each 1,000 acres cultivated.*

As we said last year, in our March (1910) issue, when writing on the "Rubber Boom," we are pleased to see a portion of the surplus wealth of this country being profitably invested overseas as it broadens the basis of our investments, and it is all the better if other outlets for investment are added to tea, rubber, sugar, &c. Now it is to be coco-nuts, next, perhaps, soya beans, ground-nuts, &c.; last but not least, when the public want a "sure thing" without 300 per cent. dividend, we shall have cacao. Whatever the industry is the public will respond provided they see a possible profit and do not have to wait too long for dividends.

Investing their money in these agricultural under-

* For full details as to comparative yield of coprah oil, &c., per 1,000 nuts see our issues of February, 1911; February, August, 1910; January, February, March, October, December, 1909; April, May, 1908; August, September, 1907.

takings forces the public here to be aware that the Tropics are not only jungles or malaria swamps, and stimulates and expands the demand for our machinery and manufactured goods, thus helping to increase the demand for the cheaper class of labour on this side, and to improve the lot of the skilled artizan and render his prospects more assured. There is only one uncertainty about the whole matter, an uncertainty, too, that should not exist, and it is this:—

Who is going to plant up and attend to the estates, when the promoters, or promoting directors, have left the ship, which they are certain to do sooner or later, be it rubber, coco-nuts, or anything else? Where are all the managers and overseers necessary to immediately supervise the native labourers coming from? Our farmers and agricultural schools or colleges cannot supply them; there is only one thing to do, we must not delay in taking steps to train them; that is to say, we must establish agricultural colleges.

Even if we cannot get our tropical agricultural colleges yet awhile, arrangements can surely be made for those over here, or in our Colonies, wishing to take up tropical planting as a career to attend a good agricultural college over here, and then be trained for a year at one or other of the leading experimental and botanic stations, to be found at all our chief producing centres. If some of the students are not amenable to rule and reason they can promptly be expelled, as their conduct would prove (already, we understand, has proved) contagious and contaminate others who wish to work steadily. We are glad to see, however, that the idea that an agricultural college is needed is rapidly gaining ground. *The Financier*, always to the fore in such matters, devoted two columns to the subject in their issue of July 26th. In this they called attention to the article in our January number, when we asked that the suggested college, to be founded in Ceylon, should be established as a memorial to the late King. After this the journal dwelt fully and appreciatively on Professor Wyndham Dunstan's (who first made the suggestion) introductory remarks on the subject in our book, "Notes on Soil and Plant Sanitation on Cacao and Rubber Estates,"* in which they say:—

"The evolution of the idea of an agricultural college for the training of young tropical planters has been outlined by Professor Wyndham Dunstan, of the Imperial Institute. In the course of an interesting introduction to Mr. Hamel Smith's recently published 'Notes on Soil and Plant Sanitation on Cacao and Rubber Estates,' Professor Dunstan considers 'it is high time that we recognized, as France and Germany have already done, that it is not safe to depend upon the chance of acquisition of knowledge during the kind of apprenticeship into which young men now usually enter as a first step in the planter's life.' In his opinion the young planter can find opportunities in this country for his preliminary scientific studies either at the Agricultural Departments of one of our Universities or at one or other of the Agricultural colleges where many of our most successful farmers at home and in the Colonies acquired the rudiments of that knowledge which has stood them in excellent stead in after life.

"Professor Dunstan recognizes what the most ardent advocate for an agricultural college would be the first to admit—namely, that such an institution has its limitations. The practical details connected with successful estate management in the Tropics can be learned only on the estate, but the youngster setting out to acquire this knowledge would not find himself face to face with problems which cannot be solved by any one lacking adequate scientific acquirements. The question naturally arises as to whether it would be possible to carry the beginner's training far enough under the conditions which obtain at home to enable him to complete in a thoroughly satisfactory fashion his knowledge when working on an estate. This would be, in ninety-nine cases out of every hundred, impossible as things are at present, and that for reasons which must be obvious. It is at this juncture, then, that a properly placed and a properly equipped agricultural college in the Tropics would prove of real service to the learner. What, then, is wanted is the taking of immediate steps to see this idea of an agricultural college in the Tropics—let us say, for argument's sake, in Ceylon—brought to fruition. In common phrase, it is up to them (the leading men in the tropical planting world) to make a move, and, in our opinion, the sooner they do so the better."

With these remarks we cordially agree. In ten years' time the romance, but not the possibilities of assured incomes, will be knocked out of tropical planting; and, then, if boys at school and men at college are not trained from the start to look to the Tropics as they do now to the Church, Army, Navy, or the Bar as a profitable method of earning a living, and, if they are not coached-up to follow such a career we can never expect to hold our own against other nations in tropical development and agriculture.

* Mr. B. L. Seaton Winton, well known on account of the leading part he has taken in developing the Tropics, either by planting up rubber or other means, writes us: "An ex-planter, and late member of the Imperial Forest Service of India, trained at Cooper's Hill, I am now very much interested in rubber, coffee, cacao, &c. Allow me to congratulate you and offer you my keen appreciation of your book, 'Notes on Soil and Plant Sanitation on Cacao and Rubber Estates.' I should like to become a regular subscriber to Tropical Life, if you will let me know cost of same."

Mechanical Dryers for Tropical Estates.

A Passburg vacuum dryer and a complete "Normair" drying plant have both been sent out to the estates of the Dunkwa Development Syndicates, Ltd., West African estates at Dunkwa. The Passburg dryer, we understand from Mr. Jas. Livingston, has a surface condenser and air pump complete, whilst the "Normair" drying plant, made by the Pulsometer Co., Ltd., is provided with a centrifugal air-circulating machine, vapour-condensing machine and heating machine for drying both rubber and cacao. When this additional plant is added the Syndicate reckons to be able to coagulate 3,000 gallons of latex per day, and to dry, sheet, and crêpe some 2,000 lb. a day, whilst their drying capacity will be increased to 4,000 lb. of rubber, and 40 cwt. of cacao per diem. The chief cacao and latex seasons are from September to the end of January.

"There is no question that some form of artificial

dryer is very ungently needed in the Laguna district, Philippines, for drying coprah," reports Mr. O. W. Barrett, Superintendent of Experiment Stations out there. "These dryers are needed first because the smoke (creosote) permeating entire chunks of coprah must render them unfit for higher uses, such as making coco-nut butter, &c.; secondly, because the present method of drying over the husk and shell fire of the 'tapahan,' or native method, does not sufficiently reduce the moisture, and in consequence several forms of mould are noticeable on the product when it is ready for bagging, and this undoubtedly results in the loss of a considerable amount of oil from the coprah whilst en route to Europe. I would suggest that one of the 'Hamel Smith' patent rotary machines be tried. This machine, it is claimed, can completely dry coprah in from two to three hours without a trace of smoke in the finished product. One of these, if set up either in Manila or Pagsanjan, to demonstrate its usefulness to planters, would, I believe, revolutionize the business in these Islands." Coprah drying should be undertaken immediately after the opening of the nuts, and should be finished in twenty-four hours.

The British West African Association.

THE British West African Association has issued a notice informing members that the offices of the Association have been transferred from 75A, Queen Victoria Street, to Revenue House, 7 and 8, Poultry, London, E.C. Here have been placed a reading and writing room at the disposal of members, the former containing all the up-to-date periodical literature, including special coast information, &c., &c. Market reports on every description of African produce can be consulted, together with other particulars relating to mines, rubber, and other companies.

Members can have their correspondence addressed to the above offices and every convenience in the reading room will be found for their use.

A room for permanent exhibits of African produce, samples of ores, rubber, &c., is also attached to the Council Room and many of the exhibits now displayed by the Association at the West African Section, Coronation Exhibition, Shepherd's Bush, will be transferred there.

Association meetings will be held on the first Thursday in each month at 3 p.m., when it will be open to any member to read a paper, or open a discussion on any subject relative to West African interests. Members desiring to participate thus should give due notice to the secretaries, at 7 and 8 Poultry, as above.

On and after October 1st next an entrance fee of one guinea will be charged, and the subscription after that date will be raised to two guineas for new members. The Rt. Hon. Earl Cowley is President of the Association; Lord Kingsale, Sir William H. Lever, Bart., Sir Harry Samuel, M.P., and Capt. P. A. Clive, M.P., are Vice-Presidents; whilst Mr. H. Osman Newland, F.R.Hist.S., and Mr. Wm. H. Boyle, F.R.G.S., are joint Hon. Secretaries, to whom all communications should be addressed.

The Fertilization of Cane-Fields.

By J. WILLIAMS, N.D.A.

ON reading the lecture on sugar-cane cultivation, given a few months ago by J. C. Brünnich, Chemist to the Department of Agriculture and Stock, Queensland, one is convinced of the necessity of a practical and attentive cultivation of the soil, together with direct manuring. Before discussing the manurial requirements of the sugar-cane, the lecturer gives simple and interesting explanations of the process of plant life and growth, and at the same time much useful information on methods of cultivation which can be adopted to control the natural resources upon which the plants depend. From this study follow conclusions as to the particular needs of the sugar-cane, and when one considers the conditions under which the sugar-cane is usually grown, alongside figures which show the analysis of the cane itself, one does not require to weigh the evidence very minutely to find a verdict very much in favour of manuring. Planters and agriculturists generally will certainly find that the information given is both highly interesting and useful for practical purposes.

First, in relation to cultivation, the chief aim of the sugar grower ought to be the conservation of the moisture in the soil, since water supply is so important for the sugar-cane. The loss of soil moisture may be prevented by thoroughly stirring up the surface soil, and by mulching. Any material spread upon the surface of the soil to shade it from the direct rays of the sun will act as a mulch—loose organic materials, hay, straw, trash, will be most suitable. It is interesting to note that in the Hawaiian Islands, where there is a rainfall of 46 in., a crop yielding $\frac{3}{4}$ tons of sugar per acre was obtained, whereas an additional 46 in. of water supplied at proper intervals as irrigation water resulted in crops yielding up to $10\frac{1}{2}$ tons of sugar per acre.

Going on to matters which relate to manuring, it is important to consider the analyses of the variety of sugar-cane, "D 1,135," which is commonly grown in the Bundaberg district of New South Wales. The soils of the Bundaberg district are exceptionally low in potash, and analyses of the cane show that it contains quite a small amount of potash as compared with other varieties grown elsewhere. The fact that this sugar-cane, "D 1,135," contains a comparatively small amount of potash may be due to variety. It may be a variety of sugar-cane which makes a small demand on potash. It is just as likely, however, that the cause may be found in the potash deficiency of the Bundaberg soils, and if that is so, then much heavier yields could be got in the Bundaberg district by manuring with potash since potash is very essential to the sugar-cane.

The analyses of several varieties of sugar-cane grown in different districts in the Hawaiian Islands are given as follows (per acre):—

	In Leaves, Tops, and Dead Canes.			In Crushable Cane.		
	Nitrogen.	Potash.	Phosphoric acid	Nitrogen.	Potash.	Phosphoric acid
	lb.	lb.	lb.	lb.	lb.	lb.
Lahaina	262	887	99	114	436	136
Rose Bamboo	352	1,115	97	270	631	112
Striped Sinapore ...	297	936	77	117	461	94
Average	304	979	91	167	509	114

Taking the average of these figures we see that a crop of sugar-cane removes from the soil very large amounts of the essential plant foods, nitrogen, potash, and phosphoric acid. Adding the amounts contained in the leaves, tops, and dead canes, to that in the crushable cane, we find that the average for the whole crop is 471 lb. nitrogen, 1,488 lb. potash, and 205 lb. phosphoric acid per acre, the crop having yielded 10 tons of sugar per acre. It is to be noted that the amount of potash is exceptionally high. Even if the crushable cane only is removed from the land, one can easily understand how successive crops of sugar-cane may exhaust a soil. It is worth noting that in the Hawaiian Islands, where the sugar lands are systematically manured from the very start, it has been found by careful experiment that land even producing 10 tons of sugar per acre may be fertilized with profit so long as climatic conditions and water supply are favourable. It has also been found that different varieties require various fertilizing mixtures, and that even if the soils show by analysis that they apparently contain a sufficiency of available plant foods, the use of fertilizers in the form of artificial manures will still give greatly increased crops. Manuring not only supplies the actual deficiencies of plant foods, but also increases the activity of the beneficial flora, and improves the physical condition of the soil.

We come then to consider what forms of artificial manures suit the sugar-cane, and in what proportions and quantities they should be applied. In Queensland it has been ascertained that a top dressing with nitrogenous manures will give the best economic results only when other manures containing phosphoric acid and potash, and perhaps part of the nitrogen not in such an available condition as nitrate of soda, are applied at the time of planting. Potash ought to be applied in the form of sulphate of potash. This form contains 50-52 per cent. potash, equal to 92.5-96.2 per cent. pure sulphate of potash. The standard fertilizer for sugar-cane given by the Queensland Sugar Experiment Station contains 50 lb. each of nitrogen and potash, and 45 lb. phosphoric acid applied in the form of:—

250 lb. sulphate of ammonia, 100 lb. sulphate of potash, 300 lb. super-phosphate, per acre.

On the Experiment Station, Cheik Fadl, in Upper Egypt, a fertilizing mixture of:—

178 lb. nitrate of soda, 357 lb. superphosphate, 178 lb. sulphate of potash, per acre, gave best results with 34 tons of cane per acre.

In Churriana (Malaya) an application of 134 lb. nitrate of soda, 134 lb. sulphate of potash, 134 lb. sulphate of ammonia, 446 lb. superphosphate, per acre gave an increase of 159 per cent. in weight of cane over the unfertilized plot.

In Hawaii mixed fertilizers, supplying on an average about 60 lb. of each of the three principal plant foods, potash, nitrogen, and phosphoric acid, give the best all-round results.

Since these facts are based on practical and carefully carried out experiments, they are worthy of serious consideration by every sugar grower. They prove that scientific cultivation is profitable, and leave no doubt as to the advantages of applying artificial manures to the sugar-cane crop.

Tropical Life at the Play.

A DISAPPOINTED audience of playgoers was that which had intended to visit the Haymarket Theatre on the night of August 9th, to witness the performance of "Bunty pulls the Strings." The house stands on the opposite side of the street, a little north of the Carlton Hotel, which was found to be on fire just when the play was about to commence.

Owing to this carriages bound for the theatre were turned back by the police, and their occupants, to whom the position was explained, had no course open to them but to go home again. Realizing this, the management closed the Haymarket Theatre for the night. By Saturday (12th), however, order was restored, and we were among those who were fortunate enough to secure seats to see the play from the pen of Mr. Graham Moffat, who took the part of the principal character, Tammas Biggar, a widower, whilst Mrs. Moffat was Eelen Dunlop, whom Tammas had jilted on the wedding-day years before, but whom he was only too glad to make amends to, especially on Bunty's recommendation as being an early riser, a good washer, and economical. Miss Dunlop came from Glasgow, the others were Lintiehaugh folk, and the scene was laid in that village. We all know how Scotchmen abound everywhere, shrewd, hardworking, and economical, often either very stiff-necked or rare good companions, and when one watches such a play, the plot of which was laid in 1860, when crinolines and pork-pie hats were in fashion, you can understand where the Scotch in the Tropics got their character and habits from. They are bred in the bone, any deficiency apparently being thrashed in with a cane. It was a harsh school, but it is difficult to say it has not paid.

Each part was acted well and in a very lifelike manner. It is a play that has a good deal in it, and came as a pleasant contrast to the rather flimsy and frivolous comedies elsewhere, but there is a great deal of humour in the way "Bunty pulls the Strings," "What's wrang?" asked Tammas Biggar, who had been delayed and found the kirkyard filled with the congregation that ought to have been inside. "The minister's stomach," blurted out Weelum Sprunt (Mr. Watson Hume), who, heavy in mind and body, had no breath left from going to see what had kept the minister at home.

The company apparently was Scotch, and were all good. If we had to make a choice we might put Susie Simpson (Miss Jean Turnbull) first, who nearly caught Tammas; her acting was splendid from the tilt of her nose to the trip of her disdainful meddlesome figure across the scene. Miss Kate Moffat, as Bunty, was, however, too much for Susie, as on her recommendation her father preferred Eelen Dunlop.

Rab, Bunty's brother, acted by Mr. George Tawde, was almost as good as Bunty, and was ably supported by Miss Eva McRoberts as Teenie, whilst Weelum Sprunt (Mr. Watson Hume) was "just great," either as the elder collecting the coppers and baubees or when carrying on his daily work as a joiner. Those interested in these Scottish character plays should not fail to go and see "Bunty pulls the Strings," it is well worth a visit.

Cotton.

THE following were the prices for Cotton in London on August 10th, according to Messrs. Slann and Davies :—

	Good Fair.	Good.	Fine.	Superfine.	Good 1910. (Compare)	Good 1909.	
	d. d.	d. d.	d. d.	d.	d. d.	d. d.	
Surat kinds* ...	$5\frac{5}{8}$ to $5\frac{3}{4}$	$5\frac{7}{8}$ to $6\frac{3}{16}$	$6\frac{1}{8}$ to $6\frac{1}{2}$	—	$6\frac{3}{8}$ to $6\frac{15}{16}$	$5\frac{3}{8}$ to $5\frac{7}{8}$	per lb.
Madras	$6\frac{1}{8}$ to $6\frac{1}{4}$	$5\frac{7}{8}$ to $6\frac{1}{2}$	—	—	$6\frac{3}{16}$ to $7\frac{3}{16}$	$5\frac{1}{8}$ to $5\frac{7}{8}$	—
Bengal	—	$5\frac{1}{16}$	$5\frac{1}{16}$	$5\frac{5}{8}$	$5\frac{5}{8}$	$4\frac{7}{8}$	—
Assam	—	$5\frac{3}{8}$	$5\frac{3}{4}$	$6\frac{1}{2}$	6	$5\frac{1}{4}$	—
China	—	6	$6\frac{1}{4}$	$6\frac{1}{2}$	$5\frac{7}{8}$	$5\frac{3}{8}$	—
West Indian ...	$7\frac{3}{4}$	$8\frac{1}{8}$	$8\frac{3}{4}$	9	9	6	—
Sea Island ...	$11\frac{1}{2}$	$13\frac{1}{2}$	16	19	18	$9\frac{3}{4}$	—
West African ...	$5\frac{7}{8}$	$6\frac{1}{2}$	$6\frac{3}{4}$	—	$8\frac{1}{8}$	—	—
East ,, ...	$6\frac{7}{8}$	$7\frac{5}{8}$	$9\frac{1}{4}$	—	$8\frac{3}{4}$	—	—

* Liverpool quotations.

Last Friday (August 4th), on the eve of the holidays, the market closed strong, at an advance of over 30 points; the tendency has since been downward, and only 12 points of the improvement have been retained. The Spot quotation has been raised from 6·67d. to 6·80d. Crop accounts are generally excellent. It is impossible to quote exactly for East Indian to arrive, as scarcely any business is passing.

The import into Liverpool this week amounts to 21,832 bales, since September 1st 4,302,309, same week last year 20,189, last year's total 3,094,572 bales. The estimated Sales amounts to 23,000 bales, including "called." Middling American is quoted at 6·80d. per lb., last year 8·36d., 1909, 6·66d.

Movement of American Cotton since September 1st :—

	1910-11.	1909-10.	1908-09.
Brought into sight	11,530,000	10,299,000	13,507,000
Exports from United States since September 1st—			
To Great Britain	3,292,000	2,357,000	3,519,000
To Continent, &c.	3,967,000	3,514,000	4,573,000
Total crop	—	10,910,000	13,825,000

The latest quotations of Americans for delivery, basis Middling, any port, G.O.C. :—

	August 10th. d.	Last Week. d.	Last Year. d.
August	6·45	6·33½	8·09½
Aug.—Sept.	6·29½	6·16½	7·85
Sept.—Oct.	6·07½	5·94½	7·47½

Coffee.

By Messrs. C. M. AND C. WOODHOUSE.

PUBLIC sales, which were suspended for the August holiday, were to have been resumed to-day (August 10th), but in consequence of the Dock Strike no auctions were held, it being impossible to move goods either into or out of warehouse. The Stocks in the principal ports of Europe on August 1st, according to Messrs Düüring and Zoon, show a decrease for the month of 316,000 bags, against a decrease of 396,000 bags at the same time last year. The visible supplies show a decrease of 208,000 bags against an increase of 475,000 bags in 1910. "Futures" have been a firm market, and, though a little below the best, the last price of September Santos shows an advance for the week of 1s. 7½d.* We quote :—

		To-day.	August 3rd, 1911.
London ..	Santos, Sept. delivery	53s. 7½d.	52s. 0d.
New York ..	No. 7 Rio ,, ,,	11·65 cents.	11·38 cents.
Hamburg ..	Santos ,, ,,	57½ pf.	56½ pf.
Havre ..	Santos ,, ,,	70¼ francs	68¼ francs.

The last sales include the following, viz. :—

East India.—Neilgherry, at 65s. for smalls, 67s. 6d. to 69s. for medium, 71s. for bold.

Mocha at 70s. for greenish longberry.

East African at 65s. 6d. for small greenish.

Jamaica at 63s. 6d. for good ordinary greenish.

Costa Rica at 66s. to 66s. 6d. for smalls, 67s. 6d. to 68s. for low middling, 71s. 6d. for bold.

Guatemala at 68s. to 69s. for middling, 69s. 6d. to 73s. for bold.

Salvador at 64s. 6d. for dull foxy, 67s. 6d. to 68s. for middling, 67s. to 70s. for bold.

Nicaragua at 63s. for smalls, 68s. 6d. for middling, 70s. for bold.

Honduras at 63s. for palish foxy.

Colombian, &c., at 64s. to 64s. 6d. for smalls, 68s. to 69s. for middling, 68s. 6d. to 72s. for bold.

Dumont Santos.—Washed at 63s. to 65s. 6d. for smalls, 66s. to 66s. 6d. for medium, 67s. 6d. to 68s. 6d. for bold.

* Present prices should be compared with those given since January, for the importance of the rise to be fully realized.

The increased cost of living is making itself felt throughout the Tropics as well as at home. In India, of course, the cost of foodstuffs has been substantially increased, and now we see, by *The Cuba Review*, that while there has been a great deal of talk in the U.S.A. over the increased cost of living there, the same conditions occur in Cuba, where high duties and high rents weigh heavily on the labouring classes, although the manufacturers have had to raise their wages to a level that the smaller cigar makers find leaves them no profit. So hard up have the Havana folks become that the city council recently distributed 153 pairs of shoes to poor children of the public schools of the city. Although it cannot be a great hardship in Havana to go unshod, such a gift betokens a rather severe pinch of poverty.

Sugar.

According to Mr. C. Czarnikow, the drought, with the exception of a few quite insufficient thunderstorms, has continued unabated in all beet-producing countries, and has not failed to have a very marked effect upon prices. The improvement, however, suffered a temporary check at the end of last week, when large realizations took place, partly on account of predicted rains and partly because some people preferred not to carry too large engagements over the holidays.

Old crop quotations, which closed on August 5th at 13s. 9½d., declined to 13s. 8¼d. for August and September, but next May delivery, which at the time of our last report closed at 12s. 11¾d. to 13s., and was dealt in largely on Friday at 13s. 1½d., declined, for reasons mentioned above, on Saturday (12th) to 12s. 10¾d.

On the re-opening of the market on Tuesday we found the Continental centres excited at about 6d. advance, and the crop reports helping, we have reached 14s. 6d. for August, 14s. October-December, 14s. 2d. for May, closing to-day at 14s. 6¾d., 13s. 11¾d. and 14s. 2d. respectively.

From some parts of both Germany and Austria crop reports of a most alarming nature continue to reach us, and experienced people have come to the conclusion that Germany, even should the weather turn favourable, will find it difficult to produce 2,000,000 tons during the next campaign. Austria continues to estimate the deficiency at about 250,000 tons, and from all we can gather from other countries, unless circumstances change considerably for the better, a shortage of 800,000 tons is quite probable in Convention countries, especially as France, which was to bring in a certain surplus, does not seem quite so sanguine about it.

The total production in Cuba up to July 31st is cabled at 1,440,000 tons, so that it seems doubtful whether the crop after all will reach 1,500,000 tons, unless a large quantity is stored up in the Island.

In New York prices remain below European parity, but will very shortly have to assimilate themselves to values of non-privileged sugar.

The American market remains unchanged for spot sugars, with small sellers at 4.75 cents; some Centrifugals for August shipment sold at 4.86 cents= 16s. c.i.f. for 96 per cent. Cubas=14s. 6d. c.i.f. for 96 per cent. Javas=13s. 6d. f.o.b. Hamburg for 88 per cent. nett beet.

In the United Kingdom business in Cane Sugars has been only upon a moderate scale, partly owing to buyers' absence for the holidays and partly to the fact that owners hold very firmly in anticipation of higher values.

From Cane-producing countries there is not much news. The West Indian mail reports favourable weather for the growing crop in Trinidad. In Cuba rain is needed.

With British West India, owing to the Bank Holiday, there have been no auctions of grocery Crystallized, and privately only about 2,000 bags changed hands, chiefly Trinidad at 17s. to 18s. 3d. duty paid for middling yellow to fine pale.

In Liverpool 2,500 bags Mexican Whites sold at 14s. 9d.

The India-rubber Market.

By Messrs. S. Figgis and Co.

On August 11th fine hard Pará was steady at 4s. 7½d. to 4s. 8½d., and there was very good competition for Eastern Plantation in the auctions of August 9th and 10th and a general advance of 1d., whilst the better qualities of sheet and pale crêpe, which were not plentiful, went even higher. Light brown sold very high.

At the auctions (on August 9th and 10th) Plantation Malay sold—sheet, fair to fine smoked, 5s. 4d. to 5s. 7½d.; mouldy and part smoked, 4s. 8d. to 5s. 3¾d.; fair to fine unsmoked, 5s. 5d. to 5s. 6d.; damp, mouldy, pressed, &c., 4s. 8d. to 5s. 4d. Block, fine pale Lanadron, 5s. 6¾d. to 5s. 7½d. Crêpe, fair, fine, pale and dull, good palish, 5s. 3d. to 5s. 7½d.; light brown and grey, part streaky, 5s. 1d. to 5s. 6d.; clean brown, 4s. 10d. to 5s. 3d.; dark brown, part specky, 4s. 3d. to 5s.; black, soft and pressed, 3s. 3d. to 4s. 9d.; smoked, 4s. 10¼d. to 5s. 4¼d. Scrap and virgin, fair to fine, 4s. to 4s. 7¾d.; mixed and inferior, 2s. 3¼d. to 3s. 8½d. Rambong, fine scrap, 4s. 5¼d. to 4s. 6d. Crêpe, 4s. 8¼d. Castilloa, good block, 4s.; inferior sheet, 2s.

Ceylon.—Sheet and biscuits, fair to fine (good worms 5s. 6½d.), 5s. 5¼d. to 5s. 5¾d.; damp and pressed, 4s. 10½d. to 5s. 3d. Crêpe, thick, fair to fine, 5s. 4¼d. to 5s. 7¼d.; fair to fine, pale and good palish, 5s. 3½d. to 5s. 6¾d.; clean and light brown, 4s. 11d. to 5s. 4¾d.; dark brown, 4s. 7d. to 5s. 1¼d.; black, soft and pressed, 3s. 3d. to 4s. 6d.; smoked, 4s. 6d. to 5s. 0¾d. Scrap and cuttings, fair to fine, 4s. 1d. to 4s. 7d.

Indigenous and other rubbers were mostly bought in, but a few lots sold, including:

Mozambique, Zanzibar, &c.—Soft brown crêpe manihot at 3s. 6d. to 3s. 9d.; soft Lewa ball, 3s.

Malaysian.—Dark crêpe, 2s. 8d. to 3s. 1½d.; black, 2s. 5¼d. to 2s. 6¼d.

From other sources we learn that previous to these sales the market had been very quiet, with little disposition to operate, either on the part of buyers or sellers. The movement in prices was slight, but with a downward tendency, the market closing (on August 5th) steady at about 2d. decline, with sellers of hard fine on the spot and near at 4s. 7d., after sales at 4s. 7½d.; whilst August-September delivery sold at 4s. 8d. to 4s. 8½d. to 4s. 7d.

Negroheads firms, but quiet. Manaos Scrappy August-September and September-October deliveries sellers at 4s. 1d. Cametas, small sales at 2s. 11d., and Island at 2s. 7d.

Bolivian: Fine nominally quoted at 4s. 7d.

Peruvian: Value of fine nominally 4s. 5d.

Caucho Ball had been firm, with small sales on the spot at 4s. 1½d. and value, closing buyers September-October and October-November deliveries at 4s. 1d.

Mollendo: Fine had been in good demand, but with little offering, few sales have occurred; closing value 4s. 2d.

The week after the holidays opened firm, afterwards becoming weak and rather lower, but closing very

steady. Hard fine on the spot and August-September delivery quoted 4s. 8d. value, September-October sold at 4s. 8d. and value, October-November 4s. 7½d. value, November-December and December-January 4s. 7d. value. Soft fine quiet; August-September and September-October 4s. 5d. value.

Negroheads quiet. Manaos scrappy August-September and September-October delivery 4s. 1d. sellers.

Caucho Ball quiet. September-October and October-November delivery 4s. 1d. value.

After this came the auctions, when plantation rubber sold as advised above.

Para rubber statistics for the month of July (tons):—

	Pará.	Caucho.	1911.		1910.	1909.	1908.
Receipts at Pará ..	1,160	260 =	1,420	agst	2,330	1,400	1,310
Shipments to Europe	800	350 =	1,150	,,	1,200	700	660
,, America	710	200 =	910	,,	890	720	840

Crop statistics, June 30th, 1910, to June 30th, 1911 (twelve months):—

	Pará.	Caucho.	1910-11.	1909-10.	1908-09.	1907-08.
Pará Receipts (1910-11	30,270	7,230	37,500	39,130	38,090	36,650
Pará Receipts (1909-10	31,390	7,740				
,, Shipts., Europe	14,870	5,040	19,910	21,860	19,200	21,740
,, ,, America	11,970	1,600	13,570	17,040	19,050	14,670

Writing on August 3rd, Messrs. Zorn and Leigh-Hunt reported that the rubber sales in Antwerp on July 28th showed very satisfactory results, with an advance of about 10 per cent. in the prices realized for Congos, and over 14 per cent. in those obtained for plantation sorts.

Our friends in Antwerp write as follows regarding the position:—

"The demand during the last month has been much better than for some time past, manufacturers apparently realizing gradually that there is but little chance for lower prices at present. As regards the future of the rubber market, we are of the opinion that prices will be maintained near the present level for some time to come, since the importance of the visible supply is being outweighed by the small receipts in Pará and Manaos, as well as by the fact that the out-turns of plantation crops, owing to the drought in the East, are at present much smaller than had formerly been anticipated. Moreover, we expect a steady demand on the part of the manufacturers, who will be obliged to provide for their fall requirements. The new Antwerp 'Future' market, which has been established under the control and guarantee of the Caisse Internationale de Liquidation of our City on July 1st, is developing in an entirely satisfactory manner. Up to date 1,000 tons have already been registered, which tends to show that all parties concerned have been quick in grasping the advantages which the new institution offers to the manufacturers as well as to the importers."

Those interested in rubber planting in Siam will note with pleasure that (according to Mr. Acting-Consul Crosby), although the exhibits of rubber at Bangkok Exhibition generally were of poor quality, they included a sample of rope rubber, so fine in quality, that it was pronounced by the judges to be the best they had seen in Siam.

Rubber Share Market.

MESSRS. ZORN AND LEIGH-HUNT reported on August 10th that a batch of fine rubber returns had just come to hand from the plantations, and it is very striking how well some of the young producers' outputs show up against those of last year.

The Ceylon (Pará) Company has gathered 18,267 lb. in seven months, which goes against an output of 757 lb. only in 1910. The Chota Company is coming along well with 2,750 lb. to its credit for July.

Langkat Sumatras show an output of 8,400 lb., against 3,890 lb., and the Rubber Estates of Ceylon have collected 15,512 lb. for seven months, against 2,692 lb. for the same period last year. Sungei Salaks publish a crop of 10,011 lb. for last month, which compares with 2,858 lb. last year, and the United Serdang Company is evidently going ahead with 21,827 lb. for July, against 11,647 lb.

The Sempah return is encouraging, being 1,475 lb., against practically nothing last year.

With regard to the general rubber position; from news coming through from Brazil, it appears that the industry in Pará and Amazonas is in a somewhat critical condition, owing to the shrinkage in the revenue of the two States as a result of the comparatively low prices ruling for the material, with the consequent difficulty of obtaining the necessary outside financial assistance for the usual up-river rubber-collecting operations. This sort of thing is all in favour of plantation companies, and with the further establishment of business-like rubber clearing houses as at Antwerp and Hamburg, manufacturers are likely to be converted to the use of plantation brands in largely increasing numbers.

Allagars, after offering at 3s. 3d., are now wanted at 3s. 4½d., and Anglo-Malays at 16s. 10½d. are a harder market. There is good inquiry for Anglo-Ceylons at 3¼., and shares are difficult to obtain. Beverleys are on offer at 1s. 7½d., and Beauforts at ⅞. Briehs have been picked up by investors at 24s. 6d. Borneo Trust shares remain unchanged. A good many Bukit Mertajams have changed hands round 2s. 6d., and at 2s. 4½d. are strong buyers. The excellent return from the Chersonese estate has drawn attention to this share, and they are now 3s. 3d. bid. Dalkeiths are wanted at 14s. Damansaras are obtainable at 5⅛. There has been inquiry for Duckwai shares at 2s. 4½d. Eastern Trust shares, after changing hands at ¼ discount, are now 7-32 discount buyers for foreign account. Highlands are 4 1-16 buyers. Jerams are ½ premium bid, and the Vendor shares are strongly inquired for at 30s. Jugra Land shares have been taken up to 47s. Shares are wanted at 45s. 6d. Linggis and London Asiatics maintain their quotations. Malaccas, after their recent weakness, spurted sharply to 8¾. Mid-East shares, after changing hands at 4s. 6d., are now offered at 4s. Peraks are very firm at 6s. 1½d. Selangors were pressed for sale last week at 2 1-16, but are now bid for at the price. Straits Bertams are wanted at 5s. 3d. Tenoms are to be had round 23s.

As no sales have been held of late, we publish no tea market report this month. At the sales on August 21st there was a strong demand, especially for common grades, and prices were firm to ¼d. advance.

The London Cocoa Market.

By The Editor.

When the Budget was introduced this year, and the proposed amendments in the import duties made known, I was surprised that our manufacturers did not protest, as, so far as I could understand, the benefits to be derived would mainly go to the Continental makers and still further increase their shipments to these Islands, whilst the consumption of our home-made article stood stood still or went back. "So far as I can understand," I said in June, p. 119, "the tendency (of the amendments) may lead rather to an increase in (the demand for) foreign manufactured." This, as can be seen by the January report (p. 19), had risen from 4,916 tons delivered for H.C. during January-December, 1909, to 6,415 tons in 1910, or 1,500 tons more. The deliveries of raw cocoa on the other hand, that is the cocoa needed for the home-made article, had actually fallen away, and showed a decrease of 180 tons (23,703 tons in 1910, against 23,883 tons in 1909).

Compared to our decrease, the following table, published in February (p. 40), showed how other countries had greatly increased the consumption of their cocoa and chocolate, and that of the four chief consuming centres, leaving out the abnormal deliveries in U.S.A. during the first part of last year in anticipation of a rise in the duty, we alone had gone back.

Raw cocoa delivered for consumption.

Jan.-Dec.—	1910.	1909.	1908.	
U.S.A. 12 months	49,340	49,524	40,568	tons (English).
Germany ,,	43,941	40,725	33,738	,, ,,
France ,,	24,697	22,910	20,142	,, ,,
U.K. ,,	23,703	23,883	20,738	,, ,,

Now I see by the *Daily Telegraph* of August 10th that Mr. A. J. Caley, on behalf of many of the principal firms in the cocoa and chocolate trade, has sent to every member of the House of Commons an important statement calling attention to the serious injury which the English manufacturers will suffer owing to the changes in taxation. The resolutions endorsed by these firms are to the following effect :—

"(1) That this meeting welcomes the promise of the Right Hon. the Chancellor of the Exchequer to grant a drawback on the cocoa in exported cocoa and chocolate, the absence of which has long constituted a serious burden on the export trade.

"(2) That this meeting views with grave concern the proposed alterations in the duties on cocoa and chocolate imported into Great Britain, which appear to have been framed without an opportunity having been given to the majority of the chocolate makers in this country to state the effects they must inevitably have upon that trade, as they will constitute a serious menace to the continued prosperity of the cocoa and chocolate industry by increasing the foreign competition, without increasing the consumption of cocoa and chocolate, thereby endangering the employment, and decreasing the wages of many workpeople, and imperilling the large amount of capital invested in this industry; and trusts that the Right Hon. the Chancellor of the Exchequer may see his way to meet a deputation from the trade, so that he may hear fully the gravity of the issues involved.

"(3) That this meeting is of opinion that the import duties on confectionery containing chocolate should continue to be levied in the same groups as heretofore, and be not fixed for individual manufacturers; otherwise British manufacturers will have no knowledge as to what duty competing foreign goods have paid."

It is further pointed out that while the proposed reduction in the duty, amounting in some kinds of chocolate to ¾d. a lb., will be a great advantage to the foreign manufacturer, it will not benefit the actual consumer, who buys chocolate by the ounce, as the reduction of ¾d. a lb. cannot be divided by ounces."

I am awaiting further developments with some curiosity, as I wonder why this agitation did not come to a head before. Coming now to more ordinary market gossip, I have to report that the cocoa market continues steady, and, whether or not, as our continental exchanges claim, the proposed valorization of Portuguese cocoas (San Thomé and Bahia) has put these growths at a premium, prices quoted later on show that all growths are realizing full rates. At Havre it will be noted that no value is placed against Bahias, whilst San Thomés are quoted 66fcs. to 69 fcs., against 65 fcs. to 69 fcs. at the end of June. In London sellers are asking a high price for superior Bahia, over 60s., but I have heard of no business at such a figure, whilst some 200 bags of rather poor "fair" quality realized only 53s., which was nothing out of the way against prices paid for other kinds. Compared with fine Grenadas, I should value superior Bahias at 58s., or at the outside 59s. Those who believe in the success of the valorization scheme should take note of what is coming forward from other centres, as already at Havre sellers' ideas for Bahia and San Thomé are causing buyers to turn to other growths, especially San Domingo, Haiti, Venezuela, and even Pará. The last-named leads one to believe that the valorization scheme does not cover the whole of Brazil. Of Gold Coast and Trinidad transactions our friends at Havre say nothing as regards business, but it will be noticed that there are nearly 100,000 bags in stock at the French port between these two growths, against just half the quantity of Bahia and San Thomé combined. Full details ran as follows at the end of July:—

Havre, July 31st.—	Landed. *July* only. Bags.	Del'd. *July* only. Bags.	Stock. 1911. Bags.	Value. Fcs.	Stock. 1910. Bags.	Value. Fcs.
Pará ...	6,743	743	25,209	69 to 72	26,179	66 to 70
Bahia ...	3,003	7,184	28,895	69 ,, 72	24,153	60 ,, 65
Venezuela ...	10,014	4,745	45,825	69 ,, 160	54,158	63 ,, 150
Trinidad ...	3,573	3,416	50,630	69 ,, 72	56,195	66 ,, 70
Grenada and other W.I.	962	647	5,931	62 ,, 69	5,529	58 ,, 66
San Thomé...	1,000	5,520	20,156	66 ,, 69	11,645	63 ,, 65
San Domingo	5,725	1,430	9,835	61 ,, 66	13,086	55 ,, 59
Haiti ...	1,224	1,478	15,079	52 ,, 66	18,925	49 ,, 62
Accra ...	1,701	5,934	48,046	63 ,, 64	19,960	57 ,, 60
Guayaquil ...	450	660	14,259	70 ,, 80	7,884	70 ,, 82
Others ...	454	1,163	24,657	—	28,480	—
Totals ...	34,849	32,920	288,522		266,194	bags
In 1910 ...	39,275	25,618		In 1909	202,893	,,

London Stock, August 12th—	1911. Bags.	1910. Bags.
Trinidads	8,427 ..	10,632
Grenadas	14,556 ..	16,212
Other W.I.	7,729 ..	5,836
British West Africa ..	5,787 ..	3,792
Portuguese West Africa ..	7,381 ..	629
German West Africa ..	5,967 ..	2,230
Ceylon and Java	17,665 ..	17,835
Guayaquil	39,103 ..	26,501
Brazil and Bahia	1,950 ..	1,176
Other Foreign	11,923 ..	11,813
Totals ..	120,488	96,856

In spite of complaints against the import duties and the tropical weather we are having, I am glad to see that our deliveries for home consumption during July were considerably above both last year and the year before, viz., 2,687 tons, against 1,564 tons last year, and 1,747 tons in July, 1909. This makes the seven months' total work out as follows:—

Raw cocoa only—	Landed.	Del'd. H.C.	Export.	Stock (July 31st)
Jan.-July, 1909—	23,298	13,934	3,512	10,898 tons
,, ,, 1910—	19,433	12,924	4,000	11,126 ,,
,, ,, 1911—	22,216	14,288	3,629	13,909 ,,
	Incr. 2,783	Incr. 1,364	Decr. 371	Incr. 2,783 ,,

As to business done, considerable transactions have taken place with Guayaquils on the spot, and "for arrival" the tone is very firm, so firm indeed that the parity is well above London equivalents given below, and further inclination to do business was checked, but not before some 7,000 bags had changed hands at prices given below. Of Trinidads supplies continue so small that the trade in them cannot be large; both here, however, as well at the centre of production (Port of Spain), prices remain very firm with a tendency to go higher. Fine Ceylons would sell well if available, but of Bahia, San Domingo, or San Thomé there is not much to say. Cabled quotations for fine San Thomé at 55s. f.o.b. Lisbon were received on August 10th.

Owing to the August Bank Holiday and the strikes, on which account it was estimated at one time that some 220,000 men were loafing about doing nothing, no sales have taken place since August 1st. and the auctions on that date were too small to make a market. Meanwhile present values range as follows:—

Trinidads.—Fine marks, 61s. and 62s.; superior, 63s.; good mid. to good red, 59s. to 60s.

Grenadas.—Fine marks last sold at, and should still be worth 57s., and possibly more; ordinary unfermented to good red, 52s. 6d. to 55s.

Jamaica.—Leaving out the superior grades similar to what sold the other day at 59s., fine marks are worth up to 56s., and fair ordinary down to 51s.

St. Lucia should realize 50s. to 57s. for her best marks, as the last business reported was at 56s. 6d.

Dominica.—Fair sold at 52s., but good fermented should be worth 55s. or 56s.

Demerara sold at 58s. for fine.

Surinam realized 55s. for good reddish.

Samoa last sold at 78s. for fine, and 68s. to 74s. for fair to good bold.

British West African sold in London at 51s. for good fair reddish, and up at Liverpool, 1,000 bags sold in two lots at 52s. for 373 bags, and 47s. to 52s. for 631 bags.

German Cameroons are valued at 54s. to 56s., against 49s. to 54s. for British West African; 55s. to 57s. for San Thomé; and 53s. to 59s. for Bahia.

Guayaquils have been selling as reported at 64s. for fine Arriba; 57s. to 59s. for fair; 59s. for fine Caraquez; 55s. to 57s. for fair to good; 55s. 6d. to 59s. for Machala, and 52s. 6d. to 53s. was paid for Tumaco.

Ceylons.—Fine realized 85s.; fair medium to good bold plantation, 65s. to 75s.; whilst up to 66s. was paid for fine "Native," and down to 50s. for common.

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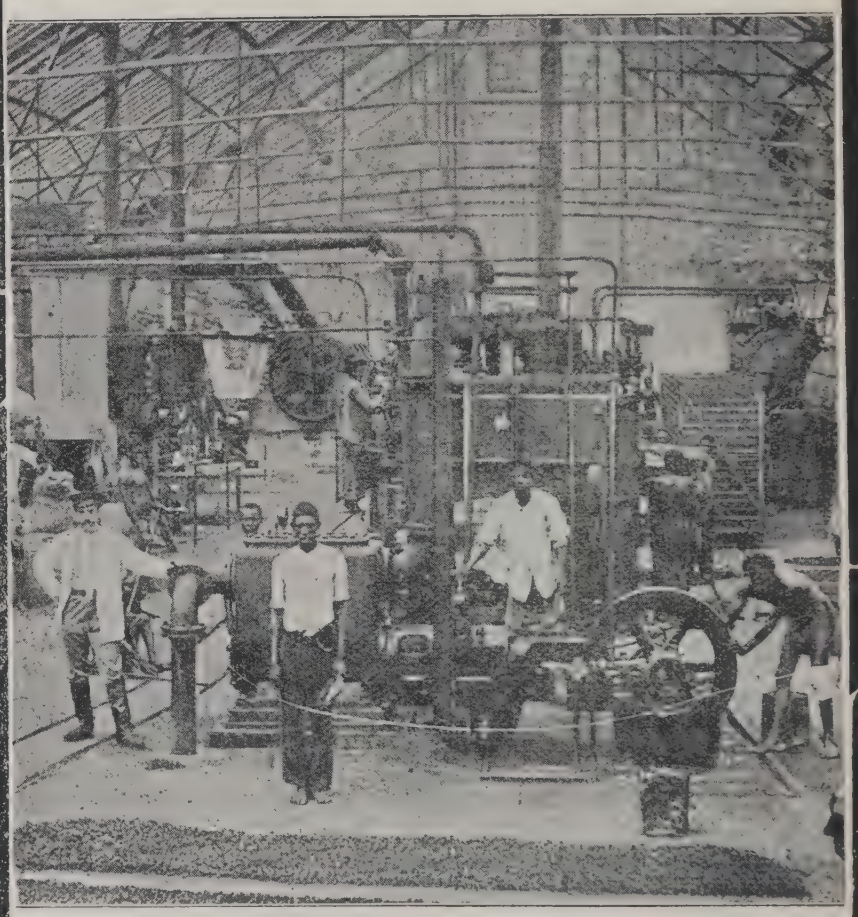

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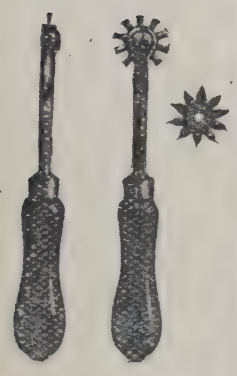

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The Rubber Exhibition.

SUNGEI KAPAR ESTATE (F.M.S.) WINS BOTH THE "INDIA-RUBBER JOURNAL'S" SHIELD, AND "GRENIER'S" TROPHY.

THE Awards Committee of the International Rubber and Allied Trades Exhibition awarded the *India-rubber Journal* (London) Hundred Guinea Shield for the best sample of plantation Pará rubber shown in the Exhibition to the Sungei Kapar Rubber Co., Ltd., Selangor, Federated Malay States, their rubber securing 96.5 points. The following were highly recommended, receiving over 90 but under 96 points: Sirinivasa Estate, Ceylon, 94 points; Tremelbye Rubber Co., Ltd., Federated Malay States, 93½ points; Bukit Rajah Rubber Co., Ltd., Federated Malay States, 93½ points; Highlands and Lowlands Pará Rubber Co., Ltd., Federated Malay States, 92½ points; Culloden Estate, Ceylon, 92 points; Klanang Produce Co., Ltd., Federated Malay States, 90 points.

The Sungei Kapar Company also won the Fifty Guinea trophy offered by Messrs. Charles Grenier and Sons (*Grenier's Rubber News*), of Kuala Lumpur, F.M.S., with a total of 98.5 points, making no less than 195 points out of a possible 200, which the Company gained on the two competitions.

As an outcome of this, we, and a good many others, were present at the Rubber Planters' Association rooms, in the London Chamber of Commerce building, on Thursday, September 14th, when Sir Henry Blake presented the trophies to Mr. Gordon Dickson, on behalf of the Company, who own the now amalgamated Sungei Kapar and Brafferton Estates, in the Federated Malay States, whilst their head office is in Edinburgh.

Those present included Mr. Herbert Wright, representing the *India-rubber Journal*, and, by deputy, Messrs Grenier's, Messrs. H. A. Wickham, E. Pollet (Belgian Consul-General), E. G. Salmon (*Rubber World*), H. K. Rutherford, Dr. Mote (India-rubber and Gutta-percha Works), Dr. Schidrowitz, and, of course, Sir Henry Blake, K.C.M.G., the President, Mr. Staines Manders, Miss Fulton, and Mr. Gordon Dickson.

After Sir Henry Blake had made the presentation, Mr. Herbert Wright, on behalf of the donors, made some appropriate remarks on the advantages of such competitions, and the lessons to be learnt from them, emphasizing the necessity of shipping rubber "to type,"* that is, of standardizing the rubber shipped so that the manufacturers can rely on receiving tons and not hundredweights of the same quality.

* *See* p. 129 of "My Ramble Round Raw Rubber," in T.L. (July, 1911), where attention is called to the matter.

The "Times" and the Tropics.

WE have pleasure in calling our readers' careful attention to the two articles appearing in this issue which we reprint from the *Times* of September 4th. The whaling industry was formerly of far more interest and importance to the Tropics than many people on this side realize. We have had a good deal to do with small centres in the West Indies, for instance, which to this day keep their whaling boats. The coat-of-arms of Trinidad, West Indies, includes a whale spouting water out of compliment to the whaling establishments that once flourished in that Island around Copper Hole, on Monos Islet, where the oil was prepared (hence the name), and at The Priests' Bay on Gasparee Island, where is the oil tank, hewn out of the rock underground.

Copper Hole, we believe, now is only to be found in name, and the oil tank to-day is full of "sweet water" filtered through from the surface and used by islanders when the home supplies run short. We have often been told off in early morning to "fetch water" whilst the others went fishing to economize in the housekeeping. Very romantic all this, but even then we could not help feeling that, with the whales that still (in 1890-1 and again in 1896-8) could be seen at times, it was a pity, with all the conveniences, the boats and the men, still at hand, that the industry could not be organized and revived. And this was only one small centre on a lot of islets between Trinidad and Venezuela, that no one will find on a map, whilst elsewhere the industry rivals the Far North in its extent and importance. The *Pan-American Bulletin* for July illustrates and describes the whaling industry in Brazil, where it is carried on to a considerable extent throughout the region extending along the coast of the State of Bahia, from Assu da Torre to Caravellas. There the whales appear in large numbers during the months of July, August, and September, and the catch in the last few seasons has averaged 300 to 400 whales. In comparison to the rate at which they breed this is a large quantity. The *Times*, it will be noticed, warns whalers against possible extermination, and they are quite right to do so. Allowing for exaggerations by extremists, unless organization and law step in to regulate the industries, both seals and whales can disappear far more easily than the individuals engaged in hunting them realize. But the precautions necessary, as with the collection of bird-skins and plumage, can be put on an international basis, and their collection must only be made in such centres and at such times as are agreed. If any particular centre shows signs of being exhausted, hunting must be stopped there until the supply, be it whales, seals, or birds, increases again. With such precautions both hunted and the hunters will benefit, and the trades connected with them will continue to flourish instead of going back for want of supplies.

COMMANDER A. J. FARQUHARSON, R.N., has joined the Board of Directors of the African Rubber Company, Limited, and Messrs. H. A. Henderson and Company, Limited, and Messrs. W. J. and H. Thompson have been appointed respectively commercial agents and produce brokers of the Company.

The Tropics and the Whaling Industry.

(From the *Times*, September 4th.)

THREE years ago whale oil, in the London market, stood about £18 per ton. To-day it is up to £23; in the interval it has fluctuated considerably, but has been as high as £25 per ton. Whalebone of the Arctic right-whale, the "bowhead" of the American whalers (*Balaena mysticetus*), has been as much as £2,800 a ton; one whale may yield a ton. Whalebone of the North Atlantic black right-whale is nearly as valuable. Whale oil has not to-day anything like the importance in the economy of civilization which it had in some former times, when it was one of the principal sources of artificial light; but it has always a market value, and it has needed but a comparatively small advance in its price to bring about a great stirring amongst the dry bones of an industry which appeared nearly dead. An incidental circumstance, due to legislative interference, has probably provided an additional stimulus to the whaling industry. In the old days when whales were universally cut up at sea only the blubber, the whalebone, the head matter (more particularly in the case of the sperm whale), and perhaps some of the large head bones which were very rich in oil were utilized. The carcase was thrown away, but now the whole carcase is utilized.

In remote seas and to a small extent the old policy is still followed, but more generally steam is now utilized to bring the whales, after having been killed, to a shore station, where they are cut up. The body of the animal can be kept afloat by suitable means long enough to permit of its being towed considerable distances. At first at these shore stations only the more valuable products were secured; the carcase was still thrown away, towed out to sea a certain distance, then cut adrift to take its chance. The very natural result of this proceeding was that huge decomposing carcases were frequently cast up on shore in the neighbourhood of inhabitants, who strongly objected to the nuisance that arose; or, if the carcases were not actually thrown up high and dry, they remained only a less nuisance in the shallow waters off shore. When it is known that a single shore station may handle 200 whales in a season, it will be obvious that the rejected carcases of so many huge animals might easily become an intolerable nuisance if not disposed of effectually. Driven by legislation and threats of legislation to find some way out, whalers in the end adopted the simple process of making good use of the entire animal; and have found that it pays them to do so. Hence the products of a modern whaling station include oils obtained, not merely from the blubber, but also from the flesh and from the bones, along with fertilizers made from the dried flesh after the oil has been extracted, bone meal, and other commodities. In due time, if whales do not become extinct, the fresh flesh of the animal will be prepared and put up in some form for human food—it is quite a wholesome flesh food, not unlike pork. Even now some small quantity is being converted into food for animals; it would make excellent dog biscuits and meal for fowls and pheasants. We have here another instance where legislation interfering with an industry has proved a blessing in disguise.

These circumstances combined—the advance in the price of oils and the possibility of profitably utilizing the entire animal—have led to remarkable developments in the last few years in the whaling industry. There are now shore stations in operation on the coast of Denmark, in the north of Norway, in Iceland, the Faroe Islands, the Shetland Islands, the Isle of Harris, the coast of Ireland, the Azores, Newfoundland, Labrador, the coast of Maine, San Francisco, British Columbia, Natal, the Cape of Good Hope, South Georgia, and South Shetlands in the Antarctic Ocean, and on the coast of Japan; whilst new stations are being projected, particularly on the South African coasts. In this development the Norwegians are most conspicuous; it is they who have established the stations in the north of Scotland, though half the capital in these stations may be British; it is they who have set up the stations in the Antarctic and in South Africa, and they who are, at the moment, the principal moving spirits in the developments going on. A South African company of Norwegian promotion has leased land at Shearwater Bay, on the south-west coast of Africa, where they will establish a station. But the Norwegians are not alone; the Americans are also moving; they recently projected a large combine to centre at Victoria, British Columbia; a German company with a capital of £50,000 has been formed at Hamburg to establish a whaling station at Lüderitzbucht, on the coast of German South-west Africa; and it is said that French promoters are arranging to establish a station on the east cost of Africa, and possibly one also in Madagascar. Repeated attempts have been made during the past twelve months to secure British capital for the latter enterprise, but British capital appears disposed at the moment, and probably wisely so, to leave whaling severely alone. Precautions, however, are necessary to prevent the possible extinction of the animal.

There is no doubt that some of the existing whaling stations, even though crudely equipped, are making large profits, which might be increased by the aid of more scientific plant; but it is equally certain that two things must occur in the near future—a great deal of money will be lost and whales will be brought to the point of extinction in most of those waters where they can be pursued with any prospect of commercial success. History is about to repeat itself in whaling; and not merely history of the 18th century, but history of much more recent date.

Fifty years ago the American production alone of sperm and other whale oil exceeded 12,000,000 gallons a year. Five years ago the world's production was but about 3,000,000 gallons. The recent stimulation of the industry has resulted in the output having been brought up to about 6,000,000 gallons in the past season, of which 4,500,000 gallons represent the production of the Southern seas. The question arises, If the whale was so nearly exterminated by the old-time whalers, whence comes this rejuvenescence of the industry? Is it that the whale has recovered from the ruthless slaughter of the 17th to the 19th centuries? Or have new conditions arisen which permit the modern whaler to hunt with success and profit where his predecessor would have had no chance?

The Coming of West Africa.

West African Palm Oil.

Modernizing the Methods of Extraction.

(From the *Times*, September 4th.)

Up to within the most recent years the ignorance on matters connected with the West Coast of Africa has been widespread, and at the present moment the possibilities of the future development not only of our own Colonies and Protectorates, but of those of France and Germany, are unknown to all but a few, who are actively interesting themselves in some important questions whose solution will mean a vast increase in the prosperity of West Africa.

The value, extent, and importance of the palm oil industry is but faintly realized by all except those who are actually engaged in the business. The amount of oil imported into Great Britain annually is now probably in the neighbourhood of 70,000 tons, while from Lagos alone the value of oil exported is between one and two millions sterling. The palm tree from which the palm fruit is obtained is indigenous and grows in enormous quantities on the West Coast of Africa, but it is most prolific from the Cameroons to the extreme West Coast, the area included embracing Northern and Southern Nigeria, the Gold Coast, the Ivory Coast, and Sierra Leone. The trees are 30 ft. in height or more, and each bears anything up to seven or eight cones of fruit, and in fully matured trees the yield is often larger. As the cones are very high up it is necessary to exercise some care in plucking them, and the natives have become very expert in this operation, climbing up the tall, straight trunks of the trees with great ease and cutting down the cones with sharp knives or cutlasses. The fruit is then detached from these cones. It consists of a soft outer covering or pericarp, which contains the palm oil, and inside this is the palm nut. This nut, when the hard covering shell is cracked and removed, yields the kernel, which contains usually about 50 per cent. of palm kernel oil, which differs in its quality and applications from the palm oil, but is about equally as valuable. The pericarp usually holds about 60 per cent. of its weight of oil or over, and as this pericarp is something approaching 40 per cent. of the whole fruit the amount of palm oil in the fruit is somewhere in the neighbourhood of 24 per cent.

The methods for extracting the palm oil and separating the palm kernels for shipment to Europe have hitherto been very crude and tedious. By the means now generally adopted by the natives only about one-third of the available palm oil in the fruit is obtained, and as the nuts are usually cracked singly by the native women it is evident that the cost of labour involved in the process, even though relatively cheap, is far higher than would be the case were more efficient methods available.

The attention of engineers* has been turned to this subject of the extraction of palm oil for some con-

* We realized this four or five years ago, and have repeatedly tried to interest those who make coco-nut oil and palm-oil machinery in the matter, but except to execute the orders when received none of the firms have so far shown any inclination to help us in our uphill fight.

siderable time, chiefly perhaps in Germany, with the result that there are now on the market several machines capable of extracting the oil from the pericarp to within about 2 per cent. of the total quantity, which is equivalent to obtaining about 22 per cent. of palm oil from the palm fruit. These machines are capable of dealing with very large quantities, and it is probable that the next few years will see a large number of them set to work and many factories established in West Africa, not only for extracting the palm oil, but for shelling the nuts and obtaining the kernel oil, which has up to now been almost exclusively done in Europe. For many years hand nut-cracking machines have been in use in Nigeria and elsewhere, but these have been for operation on a small scale, and it is with much larger power-driven machines, capable of outputs of 100 tons of oil per week, that future developments may be expected.

It is easy to understand that the machinery for the work needs considerable care and ingenuity in its construction and design; and various methods have been proposed and adopted. The palm oils are soluble in various other oils, such as petrol and benzine, and of this fact advantage is taken in some of the processes employed. In practically all arrangements the pericarp is subjected to pressure to reduce it to a pulp, when much of the oil is freed and can be separated by passing hot water over it, the oil being later separated from the water. The process can be repeated, and the nuts and kernels extracted automatically, some machines crushing the nuts at the same time and others only removing the pericarp, leaving the kernels in their shells ready for separate treatment. In some processes, which, however, are not generally considered to be efficient or to produce such good oil, the pericarp is stripped from the fruit in a dry condition, and is then deprived of its oil by pressure, the nuts passing to a nut-cracking machine and the kernels obtained. Of course, owing to the many varieties of the fruit and nuts and inequalities in size and construction, it is not easy to guarantee that all the kernels should be obtained, but machines can usually be relied upon to yield 95 per cent. of the total amount of kernels in the nuts in a state ready for the extraction of oil.

A very important point of which sight should not be lost in a consideration of a palm oil extraction plant is the fact that the palm fruit cannot economically be gathered all the year round, but only about seven months out of twelve, varying slightly, however, in different districts. It is quite useless to store the freshly-gathered fruit, and in this way keep the machinery fully occupied, as it must be treated within a few days of being taken from the tree, otherwise the oil is of little value. The nuts can, however, be stored for almost any length of time, so that it is economical to keep the plant at work on the production of the palm oil during the whole of the gathering period, and house the nuts until no more fruit is available, when the same plant may be employed for the extraction of the palm oil, the nut-cracking machines then being the only portion of the plant which is not working continuously throughout the year.

The only bar to the widespread development of the palm oil industry in West Africa at the present time is the difficulty of transport from some of the best palm districts, and this will not be overcome until much of the country is opened up, in which, however, steady progress is being made. But there are very large palm-bearing areas not far from the coast, and on the verge of wide navigable rivers, where the question of transporting the oil for shipment involves no great difficulty or expense, and it is in these districts that the first steps will be taken on a large scale. When it is remembered that the palm oil will fetch about £30 per ton in Europe at the present time, and that on a moderately large scale it could be delivered in Liverpool for under £15 per ton, including absolutely all charges, with guaranteed cost of production, it is not difficult to understand that future developments may be rapid and have an important bearing on the general prospects of the West Coast.

Paper-making from Megasse and Bamboo.

HAVING had inquiries lately regarding the machinery necessary for paper-making in the Tropics, we communicated with an eminent firm of engineers, who replied as follows: "We enclose small sample of a rough paper produced from pure megasse, but we have had other samples of very much superior quality. The samples sent, however, will show you that megasse will not produce high-class paper without very drastic and expensive chemical treatment. The percentage of fibre is very low, and we do not think that it is possible to produce high-quality paper from megasse in a profitable manner.

"The case, however, is different if the material is converted into wrapping paper or boards for boxes, as the treatment then is simple and cheap, while a greater out-turn is obtained. From the sample sent, you will see that the megasse (sugar-cane fibre or waste) produces a hard parchment-like paper, but when the megasse fibre is mixed with bamboo the paper is much more pliable and is cleaner, and, to our mind, superior in every way.

"We have seen a great number of samples of paper made from bamboo and megasse, and we are of opinion that if bamboo is available it is a much more suitable material than megasse. Bamboo is also very easily treated and can produce the highest quality of white printing or writing paper.

"Bamboo can also be very cheaply and easily treated to produce wrapping paper similar to the yellow sample (a stiff paper, or very thin board pliable enough to fold) enclosed, and if a market can be found for this kind of paper, there can be no doubt whatever about the success of a mill turning it out.*

"We also enclose a small sample of the white paper made from pure bamboo. This requires a more expensive plant, but proves conclusively the value of bamboo as a paper-making material. Our conclusions,

---

* On this point we should say that if this paper could be made a trifle thinner and more "papery" than the sample, it could successfully compete in the West Indies and elsewhere against the "straw" paper imported by the ton from France *via* Marseilles.—ED. *T.L.*

therefore, are that megasse cannot be profitably worked into a superior class paper, but it could be profitably used for making into wrapping paper or boards.

"If good quality paper is required, bamboo is a much more suitable material, while bamboo will also produce wrapping paper of a superior quality at, we believe, the same or very slightly greater cost than megasse."

We quite agree with the last sentence *re* the comparative cost of bamboo and megasse. Furthermore, it is always a debatable question whether, on all sugar estates, the megasse is not of more value as fuel than as a by-product in the shape of raw material for paper-making. Up to now all we have heard of megasse-paper has been more or less on an experimental basis. We believe that it will be quite "out of the running" if it comes to hundreds of tons being required. We shall be pleased to answer inquiries from those interested in paper-making in the Tropics, where so many fibre plants, whether specially cultivated for the purpose as bamboos or as a by-product to the main crop as megasse from the sugar mills, fibre from banana stems, or the stripping waste from Manila fibre in the Philippines, &c., are available to supply the cellulose for that purpose. We will also supply particulars *re* cost of the necessary machinery, &c., to anyone seriously interested in the matter. Such machines, worked from the main factory (sugar, rubber, tea, &c.) could of course be run comparatively inexpensively.

The Scourge of the Tropics.

The depredations of termites in the Tropics and elsewhere are so widely recognized and their habits and methods of operation have been so closely investigated, that little remains to be said on these points. The question of efficient protection, however, is an ever-pressing problem in tropical countries, and many more or less controversial points appear to have arisen in this direction.

For the purpose of preserving wood from the attacks of white ants, numerous methods of treatment have been tried, and the reports thereon collected from independent sources appear to be of very varying character. For instance, we learn from an interesting article in the *Mindanao Herald* (Philippine Isles), for July 22nd last, that from certain official tests, which are now in progress in Formosa, it is found that woods treated with creosote are wholly free from attack by white ants. On the other hand, it has been long recognized, we understand, by Indian railway engineers that creosote is of little or no value for protecting sleepers from these insects. Nor does there appear to be any consensus of opinion on the woods which are naturally immune from attack, as in some quarters it is maintained that termites will not attack teakwood, whereas in others the reverse is reported. In searching for an effective method of treatment, consideration must be given as much to ease of transportation and application as to efficiency, particularly in those parts of the Tropics where the resources of civilization are not always available. Various well-known methods of treatment which may or may not give effective protection from termites are ill-adapted for tropical use, because they necessitate the transportation of the timber to some point where a special plant is available for carrying out the process.

The above-mentioned article goes on to emphasize the necessity of a special processing, indicating that mere painting or dipping only insures a surface penetration. This, however, is a question which must be governed largely by circumstances. It is obvious that there are many cases in the Tropics where timber, whether for railway, building, or fencing purposes, cannot be treated with a process involving the use of special plant; and in such cases an efficient preservative solution applied with brushes or sprayers ensures much longer service in comparison with the life of untreated timber and amply justifies the cost of material and labour for the purpose. Where the circumstances allow of immersing the timber in the solution, in an open bath, however rough and ready, a higher degree of impregnation is of course obtained with a corresponding advantage in the life of the timber. Moreover, where large quantities of timber are being handled, the immersion method is certainly quicker and more economical.

The degree of impregnation to be obtained with any preservative solution is not so much dependent on the method of application as on the character of the wood and its condition at the time of treatment. It is obvious that a length of sapwood immersed in an open bath would absorb a greater quantity of solution than a similar length of heartwood cut from the same tree and treated under pressure, even though the process was carried so far as to injure the fibres. It may fairly be advocated that any timber which is immersed in an open bath sufficiently to enable it to absorb approximately the maximum quantity of solution which it is capable of taking up by capillary attraction, is sufficiently impregnated for all practical purposes, provided, of course, that such timber is seasoned before treatment.

The requirements of an efficient wood preservative in the Tropics may be summarized as follows:—

(1) It must absolutely protect the timber from termites and other insects, fungus, and dry rot.

(2) It must be easy of application, either by immersion, painting, or spraying, so that woodwork *in situ* can be treated where necessary.

(3) It must be non-corrosive so as not to affect nails, spikes, or other metal work brought into contact with it.

(4) It must be economical and preferably should be prepared in a highly concentrated form, capable of dilution on the spot, to reduce transportation charges to a minimum.

(5) It must *not* be inflammable and preferably should be of such a nature as to render the wood more resistive to fire.

Doubtless there are many preservatives aiming at these requirements at present undergoing exhaustive tests in the Tropics, though up to date no one method appears to have met with general acceptance in all quarters. We notice, however, that the now fairly well-known Atlas treatment is gaining general favour in India and other termite infested countries, and appears to fulfil the above-mentioned requirements to a satisfactory degree.

Guayule: Prospects of its Propagation and Cultivation.

GUAYULE (*Parthenium argentatum*): A RUBBER PLANT OF THE CHIHUAHUAN DESERT. By Francis Lloyd, Professor of Plant Physiology, Alabama Polytechnic Institute, Auburn, Ala., U.S.A. 213 pp., including a 3-paged bibliography on the subject, a table of contents, with 46 plates, each containing two or more photos or drawings. Published by the Carnegie Institution of Washington, D.C. No price mentioned.

This important work was foreshadowed by the paper which our editor had the pleasure of reading for Prof. Lloyd before the 1908 Congress, attached to the London Rubber Exhibition of that year, as its author unfortunately was not able to be present. Sent with the paper was a set of the finest photographs of the guayule lands that we have yet seen, their number and the delicacy with which the shrubs, agaves, grasses, &c., were shown up against the monotonous background excited the admiration of everyone. Pleasure nearly gave way to pain in our mind, however, as we left both the paper and the photographs in the train, coming home from the Rubber Exhibition; fortunately, by returning immediately, and its being nearly midnight, we were able to secure the parcel before it passed into other hands, and so a tragedy in the scientific world was averted.

From Prof. Lloyd's Book on Guayule.

Illustration showing the root-system of the Guayule shrub, with its lateral roots and retoños (or rattoons). These adventitious roots sometimes extend to four and even six feet (150 to 200 cm.) in length, whilst the retoños, or upright shoots, appear at about 20 cm. distance or more, and go to form new plants. The shrub marked **A**, it will be noticed, carries a small "retoño" on its lateral root.

Needless to say, the work deals fully with the guayule shrub, its history, environment, nature, physiology and anatomy, reproduction and cultivation, its rubber content and distribution, &c., &c. Each of these sections is exhaustively discussed in separate chapters, so that when you have mastered the whole there is very little about this Chihuahuan plant that you do not know. The chapters that will probably attract the most general attention are those on the reproduction of the shrub; they certainly were the first we turned to, and if entire satisfaction has not yet been attained, the results tend to prove that, given time, a new growth may be obtained in quantities sufficient to satisfy commercial requirements.

On this account one wonders whether such a plant could be cultivated to pay in the arid lands of our Indian Empire, or elsewhere in Asia. Even if the cultivation was carried on at some loss, would it not perhaps still pay to make the trial in the hopes of reclaiming the land? It is true the shrub is cut off short and removed, but then the root growth, on account of its nature and insistence to run about underground, not only breaks up the soil, but when done with it rots away, and so adds some humus to the ground, which, in the aggregate, goes a good way to help make the soil more fertile. Even the shrub need not altogether be lost, we should imagine. After being reduced to powder by thousands of tons in Mexico, we cannot say what becomes of the residue, but would suggest that the same method of transport that carries the pressed-packed shrub to the factory could return with loads of pulverized woody material, to be spread over, or buried in holes or trenches to assist the roots below, and fallen leaves, &c., to fertilize the soil. Rain and moisture might also be attracted to a greater degree, or at least, when it does descend, it would by the shrubs be conducted into the ground and retained there to a much greater extent than if the bare, rocky, sandy surface was left.

"Immense areas of land," Prof. Lloyd tells us in his concluding paragraph, headed "Catch Crops," "are available in the *Mesa Central* of Mexico, and doubtless elsewhere, where *riego temporal** is practised. This system of irrigation consists of ditches to catch the run-off, leading it to the field. The behaviour of guayule would seem to justify the belief that this plant could be grown for a sufficient period, say two or three years, in such irrigable areas, and the expense, in part at any rate, offset by growing corn or some other suitable plant as a catch crop. The guayule, when of sufficient size, should then be 'laid by' to endure a period of drought till it becomes usable, when it could be cut as suggested and restarted. This suggestion, and it is that and no more, deserves a serious trial," and with these words an interesting and useful study closes.

For these reasons, therefore, we hope that India and those countries outside America or Mexico with arid lands similar to the Chihuahuan desert will secure copies of Prof. Lloyd's masterly and exhaustive study of the guayule shrub, and study same with a view of carrying out culture experiments within their own territories to the possible advantage of their population and trade.†

A SURPLUS of 300,000 bags of brown Formosan sugar will be left this year in Japan proper, says the *Indian Trade Journal*, and the associated sugar merchants have suspended shipments of brown sugar from Takow to Japan until January 31st last, in order that the stocks congesting the market may be cleared. The merchants have also framed a scheme for the export of brown sugar from Formosa to China.

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* Temporary irrigation.

† We have much pleasure in calling attention to the photograph and our sketch of Prof. Lloyd as "Our Friend" on p. 182.

Coco-nuts for Small and Large Proprietors.

The Bureau of Insular Affairs (War Department), Philippine Isles, has issued a pamphlet on "Coco-nut Growing in the Philippine Islands, with special reference to cost of production and profits from coprah making," by Mr. Dean C. Worcester, which has pleased us very much. We hope it will have a good circulation, as any planter hesitating between planting coco-nuts or not on a large or a small scale, would certainly be induced to give them a trial after studying the simple but reliable instructions given by the author. The pamphlet runs into thirty-one pages, including nine pages devoted to giving detailed tables of cost of establishing a 2,500 acre plantation. Its interest is further increased by the inclusion of sixteen full-page photographs, showing the drying of the nuts, &c. The author starts well with the following paragraph: "After fifteen years of observation on the ground in the Philippines, I have reached the conclusion that no branch of agriculture there offers such certainty of steady and assured returns from comparatively small investments as does the growing of coco-nuts."

We quite agree with these remarks, not because the value of coco-nuts and coco-nut products to-day stands at a record level, but because we know ten, and even twenty years ago, when coco-nut planting had but few friends to speak up for it, owners of well-managed groves used to draw very fair profits therefrom in comparison to the few cents or dollars expended on the place during the course of twelve months. If coco-nuts even paid, in those days, small and large producers alike, it is well to think of what they will do with present prices and prospects. If you have good deep rich soil, plant cacao, rubber, or such crops; but if you have odd pieces of lands, or areas of poor soils, do not let these run to waste but plant coco-nut palms on them, to the benefit of the soil and your own pocket. Again, as shown in our May issue, quite a respectable crop can be obtained from palms planted avenue-fashion, for protection from wind or sun, along the border of the lands planted with the main crop of the estate. Such palms will, as a rule, yield above the average on account of the room they have to expand on all sides, and their produce will at least help to pay the cost of the upkeep of the road. When planted alone, Mr. Worcester talks of 32 ft. apart, or forty trees only to the acre, but also tells us (speaking, of course, of the Philippines) that in general it may be said that where soil conditions are favourable for catch crops, actual experience has shown that under good management they can be made to pay approximately the cost of the plantation up to the time the coco-nut trees fruit. We do not altogether gather this from the general remarks, since we are told just above this that "during the fourth, fifth, and sixth years, by the end of which time the trees will have begun to bear, it will be necessary to keep the soil clean, and there will be no returns from catch crops." Are sufficient profits obtained during the first three years to pay the cost of keeping the land clear? This cost is estimated at $2 to $5 an acre per year=$6 to $15 for the three years. According to Mr. H. C. Lamb, Superintendent of the Iwahig Penal Colony, who seems to have had large experience in the matter, three catch crops can be grown advantageously with coco-nuts. He recommends first a crop of corn, and subsequently two crops of mountain rice.* According to Mr. Lamb, the first year's catch crop should yield a profit which should go towards paying the cost of clearing the land, and the second and third years should yield sufficient at least to pay the cost of cultivating the land by covering the cost of keeping the land clean and under cultivation, which must be done in order that the young trees may make their best growth.

The other day we were discussing with a friend the cost of importing good seed-nuts into the Bahamas, and our estimates did not agree. We were, however, the more correct of the two, for we valued them at four cents or twopence each, landed at the estates in the Bahamas, and even in the Philippines. Mr. Worcester estimates the cost of good seed nuts at one to four cents each, with two and a-half cents as a fair average cost.

We are glad to see the advantages, if not the necessity, of ploughing are emphasized. "I have seen," Mr. Worcester tells us, "the value of ploughing quite conclusively demonstrated on a coco-nut plantation in Mindoro, where the trees are set out in straight lines and at proper distances. I noted that the ground had been ploughed between the trees on one side of the highway, while on the other side there had been no ploughing, but the grass had been kept very short by cattle grazing on it. The trees around which the ground had been ploughed looked decidedly more flourishing, and were bearing more heavily than were those palms where the ground had not been ploughed." The question of manures is discussed, but as we are publishing one or two articles by a leading authority on this important matter, we will not touch upon it now.

On the vexed question of yields Mr. Worcester goes to others for help, and the page devoted to their views runs as follows:—"According to a (Philippine) Bureau of Agriculture bulletin, an acre of properly-planted coco-nuts should produce about 2,000 nuts per year, or 50 nuts per tree. The same authority states that trees which by actual count average 50 nuts per tree per year abound; that at Sarabaya trees average 60 nuts per year over hundreds of acres, and that this condition will be found to prevail in Pangasinan, La Laguna, Cebu, Panay, Mindanao, and wherever trees are grown on a generous scale. It is further stated that perfectly authentic cases are reported of as many as 128 nuts being taken from a single tree in a year.

One tree at Zamboanga, the owner claims, never produced less than 200 nuts annually during a period of 23 years. This man claimed that his trees averaged him 100 nuts per year, sometimes falling to 60, and another time running as high as 130. Lieut. Fortisch, Philippine Constabulary, reports that at Ginoog, in Misamis, coco-nuts do particularly well, and that a planter there claims 120 nuts per tree per year from old, well-established trees.

Senor Vicente Diaz states that mature, bearing coco-nut trees will produce from 60 to 120 nuts per year,

* Our West Indian friends, who up to now have not made the most of their splendid opportunities to organize and develop their coco-nut lands and output, should be able in many cases to plant these catch crops, for which the local demand is important and increasing.

with an average of 80; whilst Mr. P. J. Moore, who is very familiar with conditions in the Moro Province, reports that the actual average annual number of nuts per tree in the district of Lamboanga is approximately 45.

Coco-nut Cultivation in Malaya.

MR. T. C. NOCH, acting inspector of Coco-nut Plantations, includes the following remarks in his report of coco-nut plantations, in the annual report of the Director of Agriculture, Federated Malay States, for the year 1910:—

"It seems to have dawned upon the Europeans at last, now so much interested in rubber, that it would be well to have two strings to their bow; and where could be found, considering the very favourable conditions under which coco-nuts grow on the flat alluvial land near the coast, a safer or sounder investment than the cultivation of the 'Consols of the East'?

"The area under coco-nuts in the Federated Malay States, at the end of 1910, I estimate, approximately, at 130,344 acres, and I value the whole at $29,000,000 =$222½ per acre ($1=2s. 4d.). White ants destroyed about 100 trees in the Lower Perak district, whilst squirrels and pigs do a good deal of damage. In the State of Negri Sembilan bears and squirrels were very destructive, the same as in previous years. In Selangor a caterpillar pest made its appearance, but although many of the trees were defoliated, they rapidly recovered. Spraying is, of course, the remedy, but it was found impossible to spray the higher portions of the trees without a very powerful machine.

"The total export of coprah was 125,770 piculs (1 picul=133⅓ lb.), an increase of 16 per cent. over 1909. This, of course, does not represent nearly the whole of the production. In Negri Sembilan, for instance, the greater part of the produce is sold as nuts and converted into coprah in Malacca. The price of the nuts in Selangor has risen from two and a-half to five and six cents each, owing to the increased demand by Chinese merchants who make coprah.

"The area under coco-nuts in the four States is returned as being as follows:—

	Area.	Exports.*
Perak	66,088 acres ..	91,265 piculs
Selangor	28,667 ,, ..	31,451 ,,
Pahang	19,246 ,, ..	2,585 ,,
Negri Sembilan ..	16,343 ,, ..	469 ,,
	130,344	125,770 = 7,500 tons.

Prices of the nuts in Malaya varied considerably from two to six cents each (100 cents = 2s. 4d.), against an average price of 2.4 cents each (100 cents = 4s. 2d.) in Trinidad, W.I. ($24.25 per 1,000), for picked nuts in bags of 100 f.o.b. Port of Spain.

The average value (in F.M.S.) during 1910 for coprah was $9.50, = about 22s. 2d. per picul (133⅓ lb.), against $4.96 (19s. 6½d.) per 100 lb., the average price during 1910, in Trinidad, W.I. Whilst on this subject of prices, the following figures worked out on the basis of the fortnightly quotations of Messrs. Gordon, Grant & Co., Ltd., Port of Spain, Trinidad, W.I., may be of use.

Prices of the entire nuts, coprah, and oil move quite independently of each other. Thus oil, on May 28th, 1910, stood at $1.09 a gallon, against $4.75 for coprah, and $22 only for whole nuts, yet at the beginning of March this year the nuts had advanced to $29, whilst oil was only quoted 96 cents, and coprah had dropped to $4.30. The last quotations at the time of writing (August 21st) stood at $26 for nuts, 82 cents for oil, and $3.90 for coprah. Since January 1st this year, eleven quotations for nuts give an average price of $26.36½ per 1,000. The highest rate ruled during February and March at $29; this dropped to $24 from mid-May to mid-July, and has remained at $26 since. Oil started the year at $1.08 per gallon, and gradually fell away to 75 cents on August 7th, but recovered to 82 cents on August 21st. Coprah started at $4.50, rose to $4.75 during February, dropped to $3.25 in May, then rose to $3.90 on August 21st ($1 always = 4s. 2d. in this instance). We cannot say what the record shipment from Port of Spain has been, but on July 14th last a single vessel, the ss. "Laila," took 1,150,000 nuts, consigned to Philadelphia.

* As already mentioned, the quantity exported is but a portion of the total production. The produce of any increased area coming into bearing would tend to go almost entirely, we should imagine, to swell the exports, as the local demand has already been satisfied out of the present output, so any increase to this would have to look to oversea markets for buyers.—[ED. T.L.]

The West Coast of Africa for Plantation Rubber.

By ALFRED CHANDLER, F.R.H.S.

MUCH attention is at present being given to new fields, other than the Middle East, for the making of rubber plantations, especially of Hevea (Pará rubber). Wild rubber propositions everywhere, but more especially on the West Coast, are out of favour; and rightly so, for there are special difficulties in their exploitation which make it next to impossible to earn a dividend by a company solely depending upon its indigenous forest trees.

Funtumia elastica and *Landolphia* are now getting scarcer every year; owing to the methods adopted by the natives for obtaining the latex, very large tracts are being annually destroyed.

We must therefore plant up suitable lands, of which there are plenty to be found all along the Coast, from Liberia to the Cameroons and further south: the Hevea on damp, fertile and deep alluvial soils, and the Ceará on drier lands.

With care and capital, both of which seem forthcoming, the West Coast of Africa will undoubtedly prove before very long to be among the greatest of our plantation rubber as well as cacao-producing grounds, when scientific knowledge, in company with well-trained white men to act as managers, can be obtained to supervise the native owners, and to superintend the local labourers on the large estates run with English capital.

And here on these fields it will be found that the best rubber can be produced at the lowest cost, making it possible to make a large profit when rubber settles down to a lower level of prices, as it undoubtedly will

a few years hence, when an enormous demand will be ready for a corresponding yield from this ever enlarging field of raw material.

The following reasons are given for the above statement:—

(1) *The nearness of the Markets.*—The Tropics of the West Coast are within from ten to fourteen days of the chief European markets. And it will be possible in the future to reduce the time to eight to twelve days.

(2) *The native labour*, trainable, tractable and law-abiding, is there in great abundance, and will not cost more, at present-day rates, than 7½d. per day, including rice rations, &c. For cacao or rubber the Gold Coast may, and probably will, be content to turn these products out at a lower cost than any other centre. No imported, indentured labour is required, and it is not necessary to attract labour, as it is there on the spot in abundance—men, women and children—all of whom are desirous to be trained for work under the white man.

The climate is of a type suited for the Hevea, having a mean annual shade temperature of about 80° F., *i.e.*, a maximum shade temperature in the day of 90° F., and at night of 70° F.; a damp, moist air, with a humidity of 90 per cent., and sometimes at saturation 100 per cent., the nights having generally a rain mist in the forests; winds are generally light, and a rainfall of from 100 to 150 in. per annum, with no prolonged droughts, even in the "dry" season. This allows of planting operations proceeding during the greater part of the year.

The soil in all the great river valleys is a deep alluvial decayed vegetable loam, with some clay and sand, very suitable for the Hevea. The land is occasionally flooded for a short period in the wet season, quickly drying up afterwards. On drier ground the Ceará does well, and on medium dry lands cacao cultivation can be carried out to great advantage.

Disappointing results have been experienced with coffee; but this is due to the fact that *Coffea Liberica* is generally planted. If all planters would take up the grand variety of *Coffea-robusta*, they would find in it a splendid interplanter and revenue producer.

With regard to cacao planting, it should be borne in mind that it is a deep tap-rooting tree, producing, if not properly pruned and planted, too much wood and leaves to the detriment of the pods and beans.

The tap root at times is cut off when taken from the nursery, and transplanting is best done when the young trees are some 2 to 3 ft. high. Much care is also needed in keeping the trees clean and free from the early attacks of disease.

Other good crops to grow include Kola, which is most profitable. It is indigenous to the Coast, and improves wonderfully in size of tree and yield of fruit under cultivation.

As the Palm Oil industry is so important, and the demand ever increasing for this most profitable product of the Coast, large plantations will spring up on all sides, native or European owned. The natives are exploiting this tree, in order to obtain Palm Wine, in so destructive a manner that it will pay to plant up large tracts on suitable reserved lands; or it may be interplanted where Hevea has been widely planted, as this palm forms a good shade tree.

Fishing Enterprises in the Tropics.

We have on several occasions been approached by friends in Brazil to advise them how best to organize and develop the Brazilian fishing trade, which is undoubtedly capable of yielding large profits. We have always recommended steam trawlers and the methods generally adopted by the Grimsby and Lowestoft fishing companies for securing and disposing of their catches, not forgetting the utilization of the offal for making glue, manure, &c. All this can be done quite easily and at a comparatively low cost, commensurate with the large profits obtainable if the most is made of the by-products. Japan, we see, has also been looking into the matter of her fishing industries, and came to the conclusion that they could be improved with advantage. As a result of this, we see by the London *Daily Telegraph* that four Grimsby trawlers acquired by the Japanese Fishing Company at Nagasaki, left Grimsby on September 2nd on their long voyage *viâ* Suez Canal. The journey will occupy between sixty and seventy days. The vessels will be navigated by foreign certificated masters, the Grimsby skippers acting as chief mates. Each vessel, which has been renamed, will carry a crew of ten Grimsby fishermen, most of whom have been guaranteed varied periods of engagement, extending in the case of one or two skippers to three years. It is intended to give the system of trawl fishing a most exhaustive trial, and should it prove successful further British trawlers and crews will be obtained. For some months Japanese students have been in Grimsby, and learned the various branches of steam fishing.

If Brazil will only follow the example set by Japan, her people would benefit both by earning more money, and, what is perhaps of even greater importance, by having larger and better supplies of fish for consumption.

India also can well look to her fishing methods. These have always been neglected, but for all that, much money could be made by the sale of the fish and fish products for human consumption, for manure, &c. The official handbook of the Allahabad Exhibition wisely called attention to the matter, and to the trading possibilities shown by the exhibits of the Madras Fishing Board. These included specimens of fish, oil, fish tallow, and fish guano, all from the Madras Government Fisheries Experimental Station, Cannamore, and were obtained by boiling and pressing when fresh the oil sardine (*Clupea longiceps*). The guano from this contains about 8 per cent. nitrogen, and 8 per cent. phosphoric acid. Other specimens included fish as dried on the beach under the older methods, and utilized as manure on tea and coffee estates. We mention this to show only a few of the many side lines to be obtained from a well-organized fish industry, and trust our readers in the East, Latin America, and elsewhere, will follow the trials being made by Japan, and see if they cannot benefit their home fisheries from the experience gained thereby.

Experiments are being made in India to produce tobaccos equal to those grown in Turkey and America, and those conducting the trials hope, at some future date, to see India supplying a large portion of the tobacco consumed by the whole world.

"Tropical Life" Friend.—No. 75.

PROFESSOR FRANCIS E. LLOYD,

The Guayule Expert.

AT the Rubber Congress held in connection with the 1908 Exhibition, we had the pleasure of reading a very instructive paper by Professor Lloyd on the "Guayule Plant: Its Life History, Propagation, &c.," which its author entrusted to our care. With the article was one of the most perfect sets of photographs, probably some fifty in number, showing the shrub under all the conditions and stages of its growth; we only regretted that we were not able to include some of them in our Journal.

Professor Lloyd's knowledge of the Guayule shrub is, we believe, excelled by no one, and when one realizes the time and experience that he has devoted to the study of the shrub, this is not surprising. So far as our memory carries us, "Our Friend" was attached as botanist to the New York Geographical Society's Mexican Expedition in 1890, and was director of the Department of Investigation of the Continental-Mexican Rubber Company in 1907-08. Professor Lloyd has specialized in the study of arid lands, and paid particular attention to certain aspects of the physiology of desert plants while a resident of Tucson, Arizona, as a staff member of the Desert Botanical Laboratory, 1906. He was appointed Cytologist of the Arizona Agricultural Experiment Station in the following year, 1907.

Professor Lloyd, we believe, is a Welshman, for although he was born in Manchester, his parents are Welsh, and he was brought up to speak the language, which surely is conclusive evidence of his nationality. He was educated in the Liverpool Institute, and "went West" when fourteen years old to a ranch in Mid-Nebraska, after which he moved eastward and prepared for college at the York Collegiate Institute. At one time he thought of going in for the church, or, as he describes it, the ministry, but altered his opinion on receiving his bachelor's degree in 1891 from Princeton University. Later he studied with Goebel and with Strasburger in Germany. After teaching for five years in Oregon, he accepted an adjunct professorship at the Teachers College, Columbia University. For a good many years he has been closely connected with the New York Academy, of which he is a Fellow; he is also a member of the Torrey Botanical Club, and acted as assistant editor of their bulletin from 1898-1902, and was the club treasurer from 1902-1906. He is also an honorary member of Philadelphia College of Pharmacy, and is a member of the St. Louis Academy of Sciences.

At present, besides being Professor of Botany at the Alabama Polytechnic Institute, to which he was elected, we believe, whilst the 1908 Rubber Exhibition was in progress, he is Plant Physiologist to the Alabama Agricultural Experiment Station. He is interested in the *Plant World*, with which he has been connected, editorially and otherwise, since 1905, and he also is one of the associated editors of the *American Review of Tropical Agriculture*, started by Dr. Pehr Olsson-Seffer, and which we hope will not cease with Dr. Seffer's death.

Professor Lloyd has published his full share of important articles and pamphlets on plant-life. In lieu of the titles, we may mention the more important subjects with which his writings deal: "Comparative Embryology of Rubiaceæ"; "Life History, Physiological Anatomy and Morphology of the Guayule Shrub"; "Development of Tannin in the Date and Persimmon"; "Review of the Vegetation of Northern Zacatecas, Mexico"; "Transpiration and Related Phenomena in Cotton"; "Transpiration of Certain Desert Plants"; and "Desert and Delta Vegetation." An extensive monograph, entitled "Guayule: A Rubber Plant of the Chihuahuan Desert," issued by the Carnegie Institution of Washington as No. 139 of its series of publications, has now been added to these, and our review of this book will be found on p. 178.

At the West India Dinner, held in connection with the Rubber Exhibition, we were glad to hear the chairman, Hon. Aucher Warner, K.C., refer personally to Mr. Harry S. Smith, of Tobago, and congratulate him on the machine he has invented. Whether the machine can do all that is claimed for it or not, does not detract from the enterprise and perseverance shown by its inventor in overcoming the difficulties associated with the centrifugal separation of rubber latex as Mr. Harry Smith seems to have done.

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The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

SEPTEMBER, 1911.

The Value of Scientific Research and the Planter's Co-operation.

IN the *Planters' Chronicle*, the official organ of the U.P.A. of Southern India, there appears a report of an address by Mr. Rudolph Anstead which is well worth studying, and for more than one reason.

In the first place stress is laid on the necessity for adequate research work and field work in Southern India, where Mr. Anstead has for two years been established as Scientific Officer and Adviser to the U.P.A.S.I. The remarks he makes in the course of that address are applicable to Planters' Associations the world over, and not only to Planters' Associations, but wherever agriculture is carried on.

There can be no reasonable doubt that money properly spent in devising better methods and in pointing the way for better results in crop raising confers a benefit on planters and agriculturists generally which cannot be calculated.

A well-ordered scientific department, such as exists in many countries, is practically a necessity if the best results are to be obtained. But there are two further points to be insisted on, first, that such departments shall not be starved financially, and, secondly, that the members of the association or community for whose benefit the scientific department is intended should give all the assistance they can to those in charge of it.

With regard to the first point—finance—we need hardly discuss it, for if a thing is worth doing at all it is worth doing well, otherwise it is better left alone. And in this connection Mr. Anstead instances the recent vote of some £3,500,000 made by the U.S. Government for the Agricultural Department. Anyone who has studied the question in the United States cannot help agreeing with the Minister for Agriculture that the result of the expenditure of that Department—undoubtedly the best equipped in the world—has conferred benefits on the agricultural community which cannot be measured in £ s. d.

It is necessary, therefore, in the first place that cultivators should not grudge the necessary contribution for the proper upkeep of a scientific department.*

As Mr. Anstead remarks, they will reap the benefit several times over. But while adequate funds must inevitably be the first consideration, much of the benefit will be lost unless planters co-operate among themselves and with their adviser in energetically carrying out field experiments, &c., on their own land.

There is nothing like a practical experiment carried out, under scientific supervision, of course, on one's own land, and in many cases the procedure is so simple that there is little need to encroach too much on the adviser's time.

For instance, Mr. Anstead informed the Association that in Coorg an application of nitrate of soda to the Ceará rubber tree just before tapping had given good results in increasing the flow of the latex. He added that he would like to see the method tried systematically over a large area. Here is a chance for the planters to co-operate! It is quite a simple matter to apply, say, half a pound of nitrate of soda per tree over a small area on each plantation and compare the results with those obtained on a similar area without the nitrate. The results would be of immense value, not only scientifically, but to each individual planter.

There are, of course, many other ways in which the planters themselves could obtain valuable information, and at the same time be assisting their adviser, by carrying out simple experiments on particular crops in given districts, and we only mention this one because the subject is mentioned in Mr. Anstead's address, and again because it seems so easily carried out. Further than this, we referred in our issue of March, 1910, p. 53, to the good results which had been obtained by similar experiments made by Mr. E. V. Wilcox, special agent in charge of the experiment station in Hawaii. In his report Mr. Wilcox gives minute details of several experiments, which in many cases resulted in the flow of the latex being *doubled* by the application of nitrate of soda.†

Mr. Wilcox concludes his report by a general appeal to planters "to determine the exact economy of the method by applying it on a large scale as soon as rubber trees become mature."

It is sincerely to be hoped that planters will realize how much depends, even scientifically, on their own efforts, and, as Mr. Anstead rather pathetically remarks,

* For this reason we were sorry to hear that the Agricultural Department at the Bahamas has ceased to exist. Although the work done cost money, the expenses never seemed excessive, and her agricultural industries are so important to the Bahamas that we should have thought it best to curtail expenses on anything else but this department, by which alone the Islanders can learn how best to make the most of their opportunities of trading with the outer world.

† We have issued two pamphlets on this and other matters referring to the manuring of rubber trees, and shall be pleased to forward copies *free* to any of our readers desiring them. A postcard addressed to our City office, 112, Fenchurch Street, London, E.C., giving the full name and address to which the pamphlets are to be sent, will receive immediate attention.

not leave *all* the lecturing, &c., to be done by the scientific adviser. It is to be feared that in many Planters' Associations too much attention is paid to matters of perhaps lesser importance to the detriment of the most important question of all, viz., practical and scientific *planting*.

The U.P. Exhibition, Allahabad, December 1st, 1910—February 28th, 1911.

WE have to acknowledge receipt of a copy of the official handbook of the above exhibition, a handsome volume of 255 pages × xxxi. pp. of appendix, with many full-page views, bound in pale blue cloth with gold lettering, the whole forming an attractive souvenir of what, from all accounts, proved to be an interesting and extremely useful exhibition, whether visited for pleasure or business.

From the handbook we gather the following:— Seen among the machinery exhibits was an original mail engine dating back to the time of the Mutiny, and understood to be one of the identical engines that started from Howrah with the trains bearing General Havelock's army on its victorious campaigns during the unhappy days of 1857. Since then the engine has been doing good service on branch lines until quite recently, a remarkable proof of the magnificent metal and workmanship of the last generation. Discussing the Indian Post Office, the numerical strength of its staff at the close of 1910 was 92,163, the number of post offices open 18,642, including Phari Jong, the highest post office in the world, being situated at an elevation of 16,200 feet. The mileage of the mail lines was 156,761, representing an annual travel in delivering the mails of over 135,000,000 miles. The authorities sold 7,701 lb. (123,216 oz.) of quinine to the public, to ensure their getting an adequate supply of reliable quality, at a reasonable price. Amongst the exhibits in the metal work section interest centred around the work of the Salvation Army, sent from the Gorakhpur district. The Army is engaged in that part of India in reclaiming the criminal tribes of the district, and the specimens of their work showed that they possessed a latent capacity for good work.

A curious exhibit was the "Sati Food" or "Bengal Arrowroot." This grows wild in some Bengal villages, The plant, which thrives under the shade of trees, is a small one. The prepared food is used to thicken puddings; it was exhibited packed in tins. A feature of the show was the exhibit showing the various applications of "Venesta" woods for constructional and other work. One of the most attractive stalls was that of Messrs. Burroughs Wellcome and Co. Messrs. Ransomes, Sims and Jefferies, Ltd., occupied Stall No. 5 in the Agricultural Court. This firm, which is amongst the oldest of English firms manufacturing agricultural machinery, ploughs particularly, has recently given considerable attention to the question of ploughs suitable for Indian conditions. Among other implements they exhibited a modern disc plough, modified to suit Indian cultivators, which should be extremely useful for breaking up hard lands.

The official handbook contains some very appropriate remarks on the question of ploughs and ploughing. This is on pages 199/200, under the heading "Agricultural Demonstration Ground." "The ordinary Indian plough," we are told, "is, for certain purposes, about as inefficient as it could be; strictly speaking it is not a plough at all; it makes a tolerably efficient seed-drill, a somewhat inefficient cultivator, but it is quite incapable of breaking up land properly." The small, cheap, and light ploughs, introduced by the Agricultural Department in order to meet this want of a really good plough, were shown by different firms in England and India on the same patterns. There is no doubt, however, that a better plough still is necessary if land is to be ploughed during the hot weather without irrigation. Experiments have shown that one of the most important improvements that can be introduced into ordinary Indian agricultural practice is the ploughing of the land at the beginning of the hot weather; where irrigation is available this can easily be done by the ordinary Meston or Watts ploughs, supplied by the Agricultural Department, but where irrigation is not available this is not possible with the cattle generally at the disposal of the cultivator. The rapid development of co-operative societies places cultivators in a better position to purchase more expensive and better implements than has previously been the case. Many ploughs, although beyond the purchasing capabilities of the ordinary individual cultivator, are well within the means of a comparatively small zaminder who cultivates his own *sir'* land." It should always be remembered that a good plough, although expensive at the start, is far more economical in the long run than a cheap one. For this reason it was deemed advisable to arrange for working exhibits of ploughs of a very varied description, and these demonstrations, we should imagine, must have been highly successful, much appreciated, and conducive of imparting considerable benefits on those who witnessed them.

Meanwhile we regret to see from the *Times* that in the official preliminary forecast of the cane-sugar crop of Eastern Bengal and Assam, 1911-1912, dated August 2nd, the area planted is returned by district officers as 177,800 acres, or 3,400 less than last year, the decrease being most marked in Goalpara, Sakhimpur, and Rajshahi. The statement says that in Eastern Bengal the cause of the steady decline in cane cultivation is simply that other crops are found to give better returns for the capital and labour employed on them. As India imports sugar produced elsewhere in large quantities, the statement that it does not pay the natives to produce sugar locally, of rather that other crops pay better, is a clear proof of how wasteful methods of production can ruin an important industry. We have called attention to this in previous articles,* and are now working with our

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* These articles include: "The Need of Improved Methods of Cultivation for India and the Tropics," February, 1911; "Irrigation and Water Supply to Indian Estates," Januarv, 1911; "Can Central Sugar Factories be made to pay in India?" February, 1910; "Tropical Ploughing," January, 1910; "Agricultural Appliances in India," December, 1909; "Improved Agricultural Methods in India," November, 1909; "The Sugar Industry in Mysore," August, 1907; "The Cultivation of Sugar in India," March, 1907; "The Sugar Industry in India," November, 1906; "Agricultural Associations in India," January, 1906.

friends, both in India and on this side, first to increase the yield of cane per acre, and secondly, the percentage of sugar to each ton of cane crushed. With adequate plant food and irrigation, with suitable ploughs, and efficient machinery for making the sugar, we are confident that, far from these provinces (Bengal and Assam) reducing the area under canes, the landowners will largely increase their output. Of course a smaller area need not mean necessarily a reduced output, but in this instance we believe it does. What we hope to see, however, is that the present area will give at least double the quantity of sugar to the acre, and so leave plenty of room for the other crops occupying the lands formerly planted with cane.

Ploughs at the Bangkok Exhibition.

At the time when we first heard that exhibitions would be held at Allahabad, India and Bangkok, Siam, in which light steel ploughs from abroad would be so arranged as to contrast with and compete against the native wooden articles, we urged our plough-making friends to put up samples of their makes and send them over for competition. In our December (1910) issue it will be remembered that we published a special article on ploughs for the East, especially for soil sanitation and aeration on rubber estates to minimise if not actually to cure *Fomes semitostus*, or other diseases brought about by insanitary methods of cultivation, whilst in our January (1910) issue we dwelt fully on the merits of English-made "native" ploughs for India and the East. Unfortunately, at the Bangkok Show, no English firms seemed to have competed, the steel ploughs exhibited being either of American, Japanese, or German manufacture. Why this thusness? Surely we in this country can make suitable ploughs, at a profit, cheap as they may be, against these other countries. We are told there may be another exhibition in Bangkok in four or five years' time. When that time arrives we shall hope to see that our plough engineers have made amends for letting slip the present favourable opportunity of introducing their wares into Siam, by taking a leading part in the next and in other future shows.

We have always been ardent advocates for steam-ploughing rubber lands when possible, especially those from which the wise owners have removed the stumps. We were smiled at for our pains, and the steam-plough engineers were the most sceptical, or professed to be so. Now, however, we learn from *Grenier's Rubber News* that a set of capable engines and ploughs for the cultivation of rubber lands was working satisfactorily in Malacca, and that another was on the way out for a second estate. These machines, it is claimed, will easily break up lalang lands in Malaya, as they have done in the Philippines. We told the engineers so long ago, and they stubbornly refused to open themselves out for such work, and so it will be seen in Siam and elsewhere in "the awakening" East, our makers will stand aside, and let others do the investigations, hoping to gain the benefits when the case is proved. Anyone who takes the trouble to refer to our issue of January, 1910, and read there what we say concerning the advantages of using steam-ploughs in the Tropics, and the markets that such centres offer to pushing makers, will agree with what we now say. At present in Siam we agree with Mr. Acting-Consul Crosby when he says that it is doubtful whether the heavy steam ploughs and motor tractors shown at a former exhibition in Bangkok were altogether adapted to the peculiar needs of that country, but even if with Siam, the cost of steam-ploughs will, for a few years, place them beyond the reach of the present class of cultivator, there is no doubt that before long Siam, the same as other centres, will take to mechanical appliances for ploughing on a large scale and be very glad that they did so. At present the imported ploughs that seem likely to meet with most favour in Siam are steel ploughs, suitable for traction by one or two buffaloes, which weigh very little more than, and cost but slightly in excess of the native wooden ploughs. Such ploughs should do well, especially as we are told that the Siamese Ministry of Agriculture is endeavouring, and not altogether without success, to encourage the use of steel ploughs among the paddy-cultivators. Tropical Life has a good circulation among those interested in Siam, and from all we hear from our correspondents there, the country will "awake" more rapidly to modern ideas regarding cultivation and agriculture than the public, or even manufacturers, on this side seem to imagine.

The Council of the British West African Association have arranged to hold a dinner at the Criterion Restaurant on Saturday, September 30th, to celebrate the anniversary of the inauguration of the British West African Association, when it is expected that many representative officials of our West African colonies who may be in England will be present. The chair will be taken by the President, the Right Hon. Earl Cowley, supported by the vice-presidents. Price of tickets to those other than members and their guests is 10s. 6d. Applications for tickets, accompanied by remittance, should be sent in as early as possible to the Hon. Secs., 7 and 8, Poultry, Cheapside, E.C., as the space is limited.

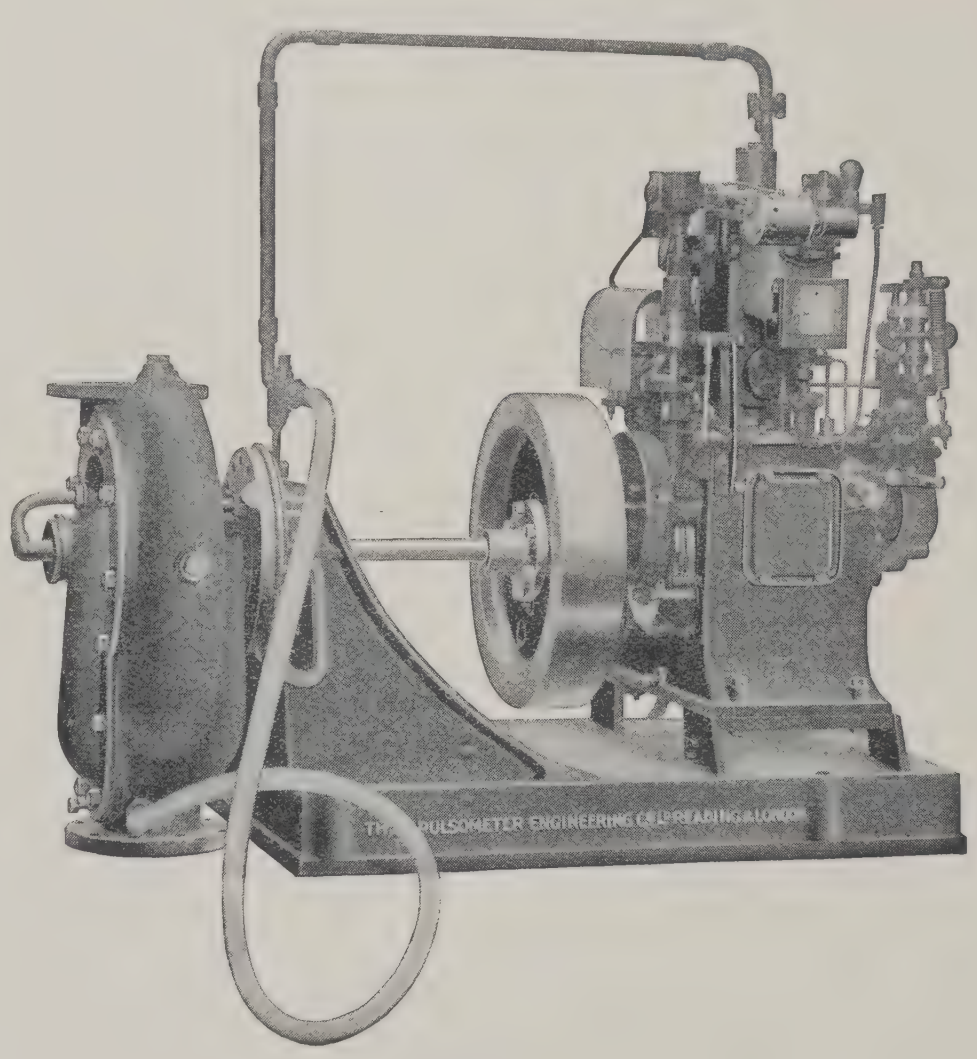
The Crystal Palace is the original home and haunt of exhibitions. Ever since Sir Joseph Paxton raised the fairy-like palace of glass for the Great Exhibition of 1851, it has fulfilled periodically the useful mission of drawing people together from all quarters to witness and admire the latest products of art, science, and commercial ingenuity.

The Festival of Empire and Imperial Exhibition, the latest and by no means the least successful of the series, has been remarkable for the high standard of excellence attained. The only prize awarded for photographic preparations was bestowed upon those handy accessories of the dark-room "Tabloid" Photographic Chemicals, which were honoured with a gold medal. The same firm, Messrs. Burroughs Wellcome and Co., secured two grand prizes for "Tabloid" first-aid equipments, and their "Kepler" malt preparations.

Irrigation in Tropical and Sub-tropical Cultivation.

IT is our aim, and always has been, to bring to the attention of planters any improvement in methods of cultivation, or any improved appliances that may tend to increase the crops, and secure to them a better return for their labour. We have lately had brought to our notice a very practical illustration of the judicious use of machinery for irrigation. The last Louisiana sugar crop was to a large extent a failure; the estimated output of 400,000 tons falling to a practical realization of 300,000 tons only. The memorable drought of last spring was one of the main, if not the the principal, causes of the deficit. From the beginning of March until the end of May, the highly tilled cane fields with their sprouting crops and their dormant seed-cane, received practically no rain. Although during this trying time the crop was being largely ruined, there was an ample supply of water to be had from the Mississippi River, and if arrangements could have been made for its dispersal it is probable that two million dollars would have been saved.

If it should be urged that the cost of irrigation is too great, we would focus our attention on the fact that when planting rice, a much less productive crop, one does not find the cost of lifting the water 20 to 30 ft. too great. The cane crop, which gave a gross return in money of four to five-fold that of rice, should therefore well sustain this cost of irrigation.



A COMPACT AND ECONOMICAL PUMPING PLANT.

Our purpose here is not to make a comparison between the growers of cane and rice to the detriment of of the former, but simply to use the illustration to once more point out that irrigation should not be looked upon as a necessary evil, but as a friend in need.

There was, perhaps, till recently some excuse for the attitude of those planters who look upon irrigation as altogether too costly an operation, and too expensive in first cost. The enormous improvement which has taken place, quite recently, in centrifugal pumps, combined with the improvement in oil engines, has entirely altered this. The modern centrifugal pump driven by an oil engine is a most economical means of raising water. The combination can be either a centrifugal pump driven by a belt, in which case the engine is, except during the comparatively short time required for erection, free for other duties, or it may be handier to have a direct coupled engine and pump. We give an illustration showing a centrifugal pump manufactured by The Pulsometer Engineering Co., Ltd., of Reading and London, driven by an oil engine. This shows a very compact and economical pumping plant suitable for irrigation or other purposes, where large quantities of water have to be raised a few feet. The capacity of the plant is 24,000 gallons per hour on a 15 ft. lift, when running at 800 r.p.m., or 37,000 gallons on 9 ft. lift, in either case requiring about 4 H.P. From these figures it will be seen that the pump will throw a large quantity of water at a very small cost. The pump is the Pulsometer Co.'s standard pattern with 5-in. branches, and has a double inlet suction. The impeller of the pump is thus always in equilibrium. A swivel arrangement is provided in order that the pump may be turned to any desired angle. The suction and discharge branches, can, of course, be cast at any position to suit the requirements of cases different from those of the set shown. The bearings are fitted with a water lubrication system of a simple and efficient character. The circulating water for the jacket of the oil engine is taken from the discharge of the pump, and returns to the pump suction by the pipe and hose shown in the photograph. The oil engine has a cylinder of $4\frac{1}{2}$ in. bore by 5 in. stroke. The ignition is effected by means of a low-tension rotary magneto, geared direct off a lay shaft on the engine, and so designed that it gives a good spark at slow speeds, thus rendering it possible to start the engine by hand without excessive exertion. The speed of the engine is controlled by a "hit and miss" governor. The lubrication of the connecting rod and the main bearings is effected by means of the splashing of the oil in the crank chamber. The total weight is only 12 cwt. The engine can easily drive the pump, as it is advisable not to cut the power of the engine too fine, in case circumstances may arise which would necessitate the pump being put to do work requiring more horse power. The Pulsometer Engineering Co. are sending centrifugal pumps for irrigation purposes all over the world.

Dead Stumps on Rubber Estates.

The more one studies Mr. Petch's book on "The Physiology and Diseases of *Hevea brasiliensis*,"* the more you want to; that is, if you take a real interest in your trees. Without saying too much about the good advice it contains, we feel justified in calling attention to the following important items, in the hopes that our readers will secure a copy of the book and study the chapter (No. VIII) on "General Sanitation" for themselves. It certainly confirms all we say in our "Notes on Soil and Plant Sanitation on Cacao and Rubber Estates" on the evils of leaving decayed stumps in the ground.

The first thing one notices is on p. 147, where we are told that the decay of the stumps is brought about by the agency of fungi; if planters wish to keep their estates free from this pest they certainly must do, as is done in temperate climates, and remove all the stumps. If this is not done, trouble is bound to arise, since lower down in the same paragraph we are told "all the root diseases of hevea, tea, and cacao which have been investigated with any approach to completeness, have been found to originate on a neighbouring stump. . . There is no known root disease of any of the plants mentioned which attacks the plant directly, they all require an external base of operations, and this they find in the dead wood of an adjacent stump. . . If there were indeed no stumps there would be no root diseases either in hevea or tea."

If root disease is to be avoided the removal of stumps should be begun as soon as the estate has been planted up" (p. 150). The section devoted to jungle stumps concludes as follows: "At the annual meeting of the Pataling Rubber Estate Co., in April, 1910, it was stated that the expense of uprooting stumps and removing all dead wood came to a total charge, once and for all," of less than sixpence for each rubber tree; "that is not a very heavy insurance to pay to rid the trees of what may cause a great deal of injury." As the Pataling Company paid 325 per cent. dividend (see Tropical Life for June, p. 117), a better advertisement of the advantages of stump-pulling or proof as to whether it pays to remove the stumps could hardly be conceived. Since it has paid the Pataling Company so handsomely to remove their dead roots, we hope that others will follow their example. It must not be imagined that this question of removing the roots is confined only to jungle trees. In thinning out rubber trees that have been "tapped to death," Mr. Petch, on p. 156, warns us that "if the trees are felled, and the roots left in the ground, no injurious effects will be immediately evident; for some years the stumps put out new shoots, which are either killed by the shade or eaten off by animals. Experience in Ceylon has shown that trouble begins about five years after the felling, by which time many of the hevea stumps are dead, and have become centres of root diseases." It is as necessary therefore to remove the stumps of the planted rubber as of the original wild tree in the jungle.

With root disease, since it is scarcely possible to detect it before the affected tree is dead, all remedial measures, Mr. Petch points out on pages 184-185, must be directed towards preventing further loss. Here the stump-puller will again come in; used in the first instance to assist in clearing the land to plant the rubber tree, its aid must again be requisitioned to pull out the diseased, or, rather the dead, rubber trees, which must be removed as completely as possible and burnt. "As a rule," again quoting Mr. Petch, "dead trees occur in patches, with a decaying jungle stump somewhere about the middle of the patch. This stump must be dug out and burnt. It is of little use to remove the dead trees only, and leave the stump from which the fungus spreads. On many estates all dead stumps have been extracted and all dead timber removed. If *Fomes semitostus* is general over a whole estate, such a course is decidedly necessary; it was followed on one estate in Ceylon in 1906, where 700 trees blew over in a single night on a field of about eighty acres."

* Price 8s. 6d., post free, of Tropical Life Publishing Department.

Reviews.

The Reduction of Domestic Mosquitoes. By Edward Halford Ross, late Health Officer, Port Said and Suez Canal District, and author of "The Prevention of Fever on the Suez Canal." 144 pp. 18 illustrations. Price 5s. net. John Murray, 50a, Albemarle Street, London, W., or Tropical Life Publishing Department.

We have had much pleasure in studying this book, and, having done so, can recommend it to those whom the author tells us on the title page it is more especially intended for, viz., for the use of municipal officers, town councils, health officers, sanitary inspectors, and those residents generally in the tropics who value their health sufficiently to read and adopt the simple but practical instructions Dr. Ross so ably puts before us in this work. Dr. Ross's suggestions for handling the natives who object to their premises being cleared of mosquitoes appeal to us as being much more likely to ultimately achieve the object sought after, than the very drastic methods recommended, and apparently adopted, by the late Professor Sir Rubert Boyce.

"Etudes sur la Flore des Districts des Bangala et de l'Ubangi (Congo Belge). Series II. Plantæ Thonnerianæ Congolenses," by Professor Dr. E. de Wildeman, curator of the Botanic Gardens, Brussels, &c., with an introduction by M. Fr. Thonner. 403 pp., with many illustrations, one coloured frontispiece, and 20 folding plates. Price, bound cloth, fcs. 15. Misch and Thron, 126, Rue Royale, Brussels, or 14s. 6d. post free, Tropical Life Publishing Department.

The first series of this work by M. Thonner appeared in 1900, and contained an account of his expedition in 1896. The present work is largely made up of the lists of the various plants, collected by the explorer during his second journey in 1909. These are described botanically, and arranged in alphabetical order, the family, natural order, and varieties being given. In the introduction contributed by M. Thonner he describes in a natural and realistic manner the incidents of the journey, and his views on the various centres visited.

Cotton.

THE following were the prices for Cotton in London on September 9th, according to Messrs. Slann and Davies :—

	Good Fair.	Good.	Fine.	Superfine.	Compare Good 1910.	Compare Good 1909.	
	d. d.	d. d.	d. d.	d.	d. d.	d. d.	
Surat kinds* ...	$5\frac{9}{16}$ to $5\frac{11}{16}$	$5\frac{13}{16}$ to $6\frac{1}{8}$	$6\frac{1}{16}$ to $6\frac{7}{16}$	—	$6\frac{3}{8}$ to $6\frac{13}{16}$	$5\frac{1}{2}$ to 6	per lb.
Madras	$6\frac{1}{16}$ to $6\frac{5}{16}$	$5\frac{7}{8}$ to $6\frac{7}{16}$	—	—	$6\frac{1}{16}$ to $7\frac{1}{16}$	$5\frac{3}{16}$ to $6\frac{1}{16}$	—
Bengal	—	$5\frac{3}{16}$	$5\frac{7}{16}$	$5\frac{9}{16}$	$5\frac{5}{8}$	5	—
Assam	—	$5\frac{3}{8}$	$5\frac{3}{4}$	$6\frac{1}{2}$	6	$5\frac{1}{4}$	—
China	—	6	$6\frac{1}{4}$	$6\frac{1}{2}$	$5\frac{5}{8}$	$5\frac{3}{8}$	—
West Indian ...	$7\frac{3}{4}$	$8\frac{1}{8}$	$8\frac{3}{4}$	9	$8\frac{7}{8}$	$6\frac{1}{8}$	—
Sea Island ...	12	14	$16\frac{1}{2}$	19	18	$9\frac{3}{4}$	—
West African ...	$6\frac{1}{8}$	$6\frac{3}{4}$	7	—	$7\frac{7}{8}$	—	—
East ,, ...	$7\frac{1}{8}$	8	$9\frac{5}{8}$	—	$8\frac{1}{2}$	—	—

* Liverpool quotations.

The Washington Agricultural Bureau Report of September 1st gave the condition as 73·2 against 89·1 last month, and 72·1 last year. This was below expectations, and has improved the market for near months, and kept it steady for distant New Crops. The latest weather accounts are excellent for growth. The Spot quotation has been raised from 6·92d. to 7·16d., and the daily sales average 10,000 bales. East Indian prices are somewhat firmer.

The import into Liverpool this week ending September 9th, amounts to 9,901 bales, since September 1st 9,901, same week last year 30,066, last year's total 58,600 bales. The estimated Sales amount to 58,000 bales, including "called." Middling American is quoted at 7·16d. per lb., last year 7·86d., 1909, 6·95d.

Movement of American Cotton since September 1st :—

	1911-12.	1910-11.	1909-10.
Brought into sight	—	12,120,000	—
Exports from United States since September 1st—			
To Great Britain	17,000	—	5,000
To Continent, &c.	38,000	—	21,000
Total crop	—	12,120,000	10,610,000

The latest quotations of Americans for delivery, basis Middling, any port, G.O.C. :—

	September 9th. d.	Last Week. d.	Last Year. d.
September	6·67	... ... 6·42	... ... 7·56
Sept.—Oct.	6·25	... ... 6·17	... ... $7·01\frac{1}{2}$
Oct.—Nov.	$6·15\frac{1}{2}$	... ... $6·12\frac{1}{2}$	... ... $6·87\frac{1}{2}$

Sugar.

THE effects of the drought begin to be felt. The market is again in the grip of speculators, reported Mr. C. Czarnikow on September 7th, who seem to consider it quite safe to "sell umbrellas and buy sugar" because the drought continues, and may indeed lead to surprising deficiencies. One million tons shortage in Convention countries is currently talked of as a minimum; some people expect this for Germany alone, and doubt whether the Bohemian important deficit will find much set-off in Hungary and France. All the while, Russia had on the 1st to 14th July stocks of 770,000 against 210,000 tons, and may have in a year's time a million tons (after exporting her contingent) over normal stocks, without being able to export them. Even the contingent is very slowly leaving the country; prices have fallen to about 13s. in bond, but export permits having been bought up by speculators last spring at 9d. to 1s. 6d., are now held for about 5s. per cwt. owing to the rise in United Kingdom and the decline in Russia. Therefore exports are interfered with, especially as towards the end of the season, when total exports, including Finland and Persia, approach the limit of contingents, then the remaining Western permits become available only after certificates of arrival in Finland and Persia have come in. It is therefore quite conceivable that some balance of the old contingent cannot be made use of for want of time. Russian manufacturers are clamouring for obtaining an exceptional contingent for the coming season from the Brussels Convention, but as this depends on Germany, Austria and France (England having already agreed not to limit imports), it is doubtful whether those countries would relieve their consumers by lowering the world's prices at the expense of their farmers.

The latter no doubt will suffer much loss; some fields look deplorable, and when comparing the published weights, one hardly knows what to expect. The leaves are only about one-third of last year's weight, and as roots last year continued to gain, whilst this year they make little progress, the deficiency must go on increasing. At the same time we are drifting into famine prices, which attract and save up sugars quite as surprisingly as cheap prices disperse it. If we go too far, strong efforts will no doubt be made to get past the Brussels door, and consumption as well as our export trade will and must fall off. For the present, however, consumption shows no sign of it yet. United Kingdom consumed in August the same as last year, and France even paid duties on 9,000 tons more. But we attracted nearly as much cane as before, and our stocks, which were 70,000 tons inferior, are now nearly equal to last year's, but Hamburg is 70,000 tons inferior (—32,000 tons in July). Germany exported 84,000 against 56,000 tons in August. Austria (excluding Hungary) exported 26,300 tons against 22,600 tons, and consumed 52,500 tons against 41,100 tons. America imported 175,000

(140,000), melted 237,000 tons (215,000) and had stocks 159,000 tons against 303,000 tons.

Though France has two months' stocks, Paris operators raised the September price from frs. 47 to frs. 60 (equal to 24s. 6d.), just to give us a foretaste of what is in store for us, and they keep on buying from Hamburg daily. As long as the market has only its present limited article to deal in, instead of an open world's contract, it must submit to manipulations, which this year are very easy for a few big speculators. On the other hand, New York raised her quotation from 5.36 to 5.61 cents, equal to 18s. c.i.f. for Javas, but refused to buy November arrival at 2s. less, probably still expecting the European collapse, which will not come off. It is, of course, possible that the entire home-grown beet and cane crop will be attracted in October-December, instead of foreign imports, but with the present speculative fever, Europe evidently is not dependent on American orders. The July-September Javas available for United States as yet only slightly exceed our previous estimate of 150,000 tons, and various of those steamers have still to be bought.

New York has bought very little during the week, but a few parcels wanted on the spot and for prompt arrival raised quotations to 5.61 cents = 4.25 cent c.i.f. Cubans, or 3.92½ cents (18s.) c.i.f. for foreign sugar, or 16s. 9d. f.o.b. Hamburg, but nothing is doing to arrive.

Formosa reports a second hurricane, and it is estimated that one-third of the crop is now destroyed, thus preventing exports to foreign countries.

The total transactions of British West India for this week amount to about 15,000 bags, at an advance of 6d. to 9d. per cwt. Demerara, fine yellow and pale 20s. to 20s. 3d. Trinidad, low middling yellow and brownish 18s. 3d. to 18s. 9d., fine yellow and coloury 20s. 3d. to 20s. 9d. St. Lucia, middling yellow 18s. 6d. to 19s., good yellow 20s. 3d. Jamaica, low greyish and brownish 17s. to 17s. 6d., low to middling yellow 18s 3d. to 18s. 9d. Syrups are selling thus:—St. Lucia, low brownish and yellowish 12s. 9d. and 13s. 9d. to 14s. 3d.; Demerara, middling yellow 14s. 9d. to 15s.; St. Kitts, good yellow 14s. 9d., fine coloury and palish yellow 16s. to 16s. 9d. Some low middling yellow crystallized Surinam realized 18s. 4½d., syrups 14s. 9d.

In Liverpool the quantities on offer are extremely limited; the only transactions reported are 400 bags Peruvian syrups at 12s. to 12s. 4½d. quay telquel.

The India-rubber Market.

The congestion caused by the recent strikes resulted, as expected, in heavy supplies being brought forward at the auctions on September 5th, 6th and 7th, notwithstanding the good business which had been done privately since the last sales.

The market for Pará, reported the *Public Ledger* on September 9th, has been more or less overshadowed by the large auctions of plantation, but the tone has kept very steady, there being few anxious sellers, and fluctuations have been slight. The tone at the close is quite firm, and Hard fine on the spot and near is quoted 4s. 9d. value, against 4s. 9½d. a week ago. Only a small business has been done for September-October and October-November deliveries at 4s. 9½d. to 4s. 8½d. to 4s. 9d. and sellers, November-December closing 4s. 8¼d. value and December-January 4s. 8d. Soft fine continues quiet at 4s. 6½d. value for September-October and October-November deliveries.

At the auctions, Messrs. S. Figgis and Co. tell us :—

Plantation Malay.—Mostly sold. Sheets, fair to fine smoked, 5s. 2d. to 5s. 6¾d.; mouldy and part smoked, 4s. 6d. to 5s. 3d.; fair to fine unsmoked, 5s. 3d. to 5s. 5½d.; damp, mouldy, pressed, &c., 4s. 6¼d. to 5s. 0½d.; Block, fine pale Lanadron, 5s. 6d. to 5s. 6¼d.; Crêpe, fair, fine pale and dull, good palish, 5s. 3¼d. to 5s. 6¾d.; light brown and grey, part streaky, 5s. 2¼d. to 5s. 6d.; clean brown, 4s. 11d. to 5s. 3d.; dark brown, part specky, 4s. 7¾d. to 5s. 2d.; black soft and pressed, 3s. 9d. to 4s. 9¾d.; smoked, 4s. 6d. to 5s. 3½d.; scrap and virgin, fair to fine, 4s. 2¾d. to 4s. 6¾d.; mixed and inferior, 2s. 11d. to 3s. 10d.; Rambong crêpe, 4s. 8d. to 4s. 9d.; sheet and scrap, 3s. 10½d. to 4s. 2¾d.; Castilloa, soft sheet and good block, 3s. 3d. to 4s. 2½d.

Ceylon.—Mostly sold. Sheets and biscuits, fair to fine, 5s. 3¼d. to 5s. 5¼d.; damp, pressed, &c., 4s. 8½d. to 5s. 1d.; Ceará, 4s. 6d. to 4s. 10d.; worms, fair pale, 5s. 4¾d.; crêpe, thick fair to fine, 5s. 4¾d. to 5s. 7d.; fair, fine pale and dull, good palish, 5s. 3½d. to 5s. 6¾d.; clean and light brown, 5s. to 5s. 4¼d.; dark brown 4s. 8d. to 5s. 2¼d.; black soft and pressed, 4s. to 4s. 8d.; smoked, 4s. 11½d. to 5s. 3¼d.; scrap and cuttings, fair to fine, 4s. 6¾d. to 4s. 11½d.; mixed and inferior, 3s. 3d. to 4s.

C. American and Colombian.—Dark ball and scrap, 3s. 6d.; loaded slab, 1s. 9d.

Mozambique and Zanzibar.—Manihot pressed crêpe, 3s. 6d. to 3s. 9d.; thin Ceará biscuits, 4s. 1½d.; reddish ball heated, 2s. 3½d. to 2s. 11½d.

Madagascar.—Good rooty slab, 2s. 1d.; dark porous slab, 2s. 2d.

Malaysian.—Dark brown crêpe, and part Virgin, 2s. 7¾d. to 2s. 10¾d.; darkish brown, part fair, 2s. 11d.

Pará statistics for the month of August (tons) :—

	Pará.	Caucho.	1911.		1910.	1909.	1908.
Receipts at Pará ..	1,290	300	= 1,590	agst	1,870	1,870	1,900
Shipments to Europe	860	320	= 1,180	,,	980	1,110	1,010
,, America	900	120	= 1,020	,,	830	220	800

Crop statistics; June 30th, 1911, to 31st August, 1911 (two months) :—

		Pará.	Caucho.	1911.	1910.	1909.	1908.	1907.
Pará Receipts	1911	4,450	560	3,010	4,200	3,270	3,210	2,870
	1910	3,020	1,180					
,, Shipts., Europe		1,660	670	2,330	2,180	1,810	1,670	1,850
,, ,,America		1,610	320	1,930	1,720	940	1,640	940

Coffee.

By Messrs. C. M. and C. Woodhouse.

Moderate supplies of Central American descriptions have been catalogued during the past week (ending September 9th) and met with a steady demand at full rates. Dumont Santos was dearer, and smalls sold at an advance of 2s. per cwt. on previous prices. Futures continue to rise on dearer Continental advices, and September is in demand at 59s. 3d. against 55s. last week. We quote :—

		To-day.	August 31st, 1911.
London ..	Santos, Mar. delivery	55s. 3d.	52s. 7½d.
New York ..	No. 7 Rio ,, ,,	11·59 cents.	11·28 cents.
Hamburg ..	Santos ,, ,,	60½ pf.	58 pf.
Havre ..	Santos ,, ,,	73¾ francs	71 francs.

The receipts at Rio and Santos from July 1st to September 6th, 1911, were 3,186,000 bags, against 3,611,000 bags in 1910, and 4,946,000 bags in 1909.

Sales include the following, viz. :—

Colombian, &c., sold at 66s. to 69s. for fair greenish to good coloury smalls, 68s. 6d. to 73s. for medium, 69s. to 77s. for bold and 70s. to 75s. 6d. for peaberry.

Guatemala at 69s. 6d. for medium, 71s. to 75s. for bold, and 72s. to 78s. 6d. for peaberry.

Nicaragua at 65s. 6d. to 67s. 6d. for smalls, 69s. to 71s. for low middling to middling, 72s. 6d. to 74s. for bold and 73s. to 76s. for peaberry.

Salvador at 71s. 6d. to 72s. for medium coloury, 74s. to 75s. 6d. for good bold and 75s. 6d. to 76s. for peaberry.

Mexican at 67s. 6d. for smalls, 70s. 6d. for middling, and 75s. for peaberry.

New Granada at 71s. 6d. for smalls, 73s. for medium, and 74s. for bold.

Vera Paz at 74s. for bold greenish.

Mombasa at 66s. for smalls.

Ecuador at 64s. 6d. for bold country damaged.

Dumont Santos.—Washed at 69s. for smalls, 69s. to 69s. 6d. for medium, 69s. 6d. to 70s. for bold, and 69s. for peaberry. Unwashed at 59s. for smalls, 61s. 6d. for medium, 63s. 6d. for bold and peaberry.

Rubber Share Market.

MESSRS. ZORN AND LEIGH-HUNT reported on September 6th that some fine rubber returns—calculated to comfort the hearts of shareholders—were to hand from the East, the outputs, in a few instances, being wonderful.

So far as some districts are concerned, the drought seems to have had very little effect—the trees having yielded as in normal seasons. On the other hand, some estates have felt the lack of moisture acutely, and it is, therefore, satisfactory to learn that the drought has now ended—good rains having fallen.

Amongst the excellent outputs announced, the following are striking :—

			lb.
Ceylon Para	... ...		5,768
	Total 24,035 lb., against 1,433.		
Doranakande	... ... January 3,014	August	6,451
Galang Besar	... ... July 7,770	August	10,009
Highlands and Lowlands	Last year 39,847		54,845
Klanang produce	... Last year 7,722		15,930
Kuala Selangor	... ...		21,197
	Total 8 months 86,907 lb., against 13,082 lb.		
Langkat Sumatra	... ...		8,700
	Total 55,983 lb., against 32,486 lb.		
London Asiatic	... ... Against 13,568		30,586
Rani Travancore	... Against 3,981		22 030
Selaba	... ... Against 7,966		17,405
Sialang	... ... Against 861		4,696
St. George	... ... Against 5,920		14,342
Sungei Salak	... ... Against 3,751		12,216

Allagars remain a firm market round 3s. 10½d., but Anglo-Malays have receded to 17s. 3d. Anglo-Sumatras are firm at $3\frac{9}{16}$. Banteng Selangors are buyers at 2. There has been a good inquiry for Beauforts at $\frac{7}{8}$; shares are, however, difficult to obtain. Brieh shares are being purchased by investors, and the price has risen to $1\frac{1}{4}$ buyers. The returns from this company's property are very encouraging. There are many buyers of Bukit Sembawangs at 1s. 9d. Chersoneses have gone back a little, and are obtainable at 3s. 7½d. A few F.M.S. shares are offering at 23. Glen Bervies are buyers at $2\frac{1}{8}$, but Highlands have reacted to $4\frac{3}{32}$. Considerable inquiry has again sprung up for Jugra Lands, and 43s. 6d. is now bid. Klanang Produces are 20s. buyers, but Kualas are easier at $6\frac{5}{16}$. Linggis are 39s. 3d. ex rights. Heavy selling of these shares took place by market operators at 40s., who purchased the rights on new shares at 9d. against their sales. Assuming the company will pay the same interim dividend as last, viz., 10½d., the exchange will yield a profit of 1s. 6d. per share, provided, of course, the old shares can be contangoed. Only while this turn was obtainable, the selling proceeded. It may be noted that the company has harvested for August exactly 100,000 lb. of rubber. Lok Kawi shares are wanted around 11s. Malaccas have reflected the recent Paris weakness, and have fallen to 8½ for the Ordinary shares; the Debentures are obtainable at 111. This company also obtained 100,000 lb. of rubber for August. Merlimaus are quite a strong market at 3s. 9d. Patalings are a little weaker at $2\frac{2}{32}$, the smaller crop of rubber for August being possibly the cause. Peraks keep firm at 6s. 6d. The August return shows an increase of about 6,000 lb. on last year. Rubber Trust shares are easier at 7s. 6d. premium. Serdang Centrals are wanted at $1\frac{15}{16}$, and Straits Bertrams at 5s. 4½d. Tempehs are enquired for at 1s. United Lankats have appreciated slightly to $4\frac{9}{16}$ rather bid—doubtless due to the excellent condition of the tobacco industry. The returns from Vallambrosa have been rather disappointing, but in view of the new acreage which will soon be tapable we consider the returns should presently increase.

Tea.

By Messrs. WM. JAS. AND HY. THOMPSON.

DURING the past week ending September 9th the trade has been well occupied in handling unusually large supplies, the direct result of accumulated arrivals during the recent labour disturbances. The quantity thus held back has in some measure been worked off and more normal conditions now prevail. The sales have been exceptionally heavy, amounting in all to 93,758 packages, which probably creates a week's record. Among Indians, marked irregularity in quality has characterized the selection, and is explained by the fact that it has been found impossible to deal with supplies in order of arrival, consequently in many instances early invoices and those of much later manufacture have been offered simultaneously. This feature has been reflected in quotations which have shown some irregularity; but apart from this the tone of the market has been weaker for all tea up to about 9½d. per lb., for which a lower level of price has been established, a movement which was not altogether unexpected in view of the recent strained situation and temporarily inflated rates. For good and fine liquoring teas and tippy kinds the active demand has been sustained, and strong shipping orders have been responsible for some erratic quotations for the more attractive whole leaf grades.

From a Calcutta telegram relative to crop prospects received by the Indian Tea Association it is apparent that throughout Assam outturn during the past month has been normal to good; the weather is favourable and prospects are fair to good. From Cachar outturn is

reported poor, but immediate prospects are considered fair. Mosquito blight is prevalent in the southern districts. Prospects are favourable in Sylhet, where outturn last month was good. The Dooars reports a good outturn during the last month from the eastern side and normal from the western. Blister blight is severe in Darjeeling, and immediate prospects are uncertain; outturn was about normal. Favourable weather in the Terai has conduced to a normal outturn; immediate prospects are fair.

With Indian teas there was again a good general demand for attractive sorts, either in respect of leaf or liquor, which were well competed for, and choice tippy teas realised high prices, finest selling up to 3s. 9½d. per lb. Common grades were easier, and frequently could be quoted ⅛d. to ¼d. per lb. below previous quotations, the price of fair Pekoe Souchong being 7¾d. to 8d. per lb., while grades above this and up to about 9½d. per lb. were from ¼d. to ½d. per lb. lower than last week, the trade being unwilling to operate in these grades except at reductions. The Darjeelings on offer included a few invoices with good flavour, which were keenly competed for and sold well, the scarcity of choice flavoured tea stimulating this demand. Some high averages from the various districts were noted by those present. For the whole sale on estate account the average price was 9⅝d. per lb., compared with 8⅝d. per lb. a year ago.

Although the Ceylon sale was large, bidding was brisk throughout, and came from all quarters of the room. The market was slightly irregular, low to medium teas not infrequently showing slight declines, while better-class invoices received very good support. In leaf teas, more lots sold at 7½d. and 7¾d. than has been the case for some time, and some of the Pekoes, selling at 8d., showed very good value to buyers. Among better grades last prices, as a rule, were maintained, and advances paid where any improvement was noted in liquor or appearance. For the whole sale on estate account the average price was 8¾d. per lb., against 8⅛d. per lb. a year ago.

A fair business is reported in Chinas among low and medium black leaf teas, and prices generally are steady.

The Java sale passed with a rather quiet tone, and, excepting for standout teas, bids were irregular and occasionally lower. For the whole sale on garden account the average price realised was 8⅜d. per lb. against 7¼d. per lb. last year.

In regard to the Dutch market, the tenth sale of the year was held at Amsterdam on September 1st, when there was a strong demand for all grades, common kinds and leaf teas frequently showing advances of ¼d. per lb.

The London Cocoa Market.

By the EDITOR.

WHEN we last discussed market news both London and Liverpool were in the midst of a troublesome strike that promised, at the time, to become very serious. Fortunately both sides came to a partial agreement, and one section, at least—the railways—are airing their woes before a Commission. August bank holiday and the strikes (docks, cartermen, and railway) caused us to have no cocoa sales between August 1st and 29th, an interval of exactly four weeks. When the sales recommenced a smart rise was noticeable, for the prices paid were 3s. to 5s. above those realized at the beginning of the month, and although during September, the Hamburg demand being satisfied, things have quieted down and prices tend lower, both the Havre quotations and my London prices show that values are still above, and in some cases considerably above, last year's parity. Meanwhile Grenada's on August 29th sold up to 60s. and 61s. 6d., and even common Dominicas realized 57s. Now fine Grenadas have dropped to 59s. to 60s., and business is difficult even when sellers are willing to give way. Up at Liverpool it is just the same. "Buyers," we are told, "show little disposition to operate even at the low values sellers are willing to accept." The Havre quotations given below were realized when we in London were at the highest point touched, and the market there has since been lower, but until larger supplies come to hand, no general breaking away in prices seems to be expected, in spite of the large stocks. These, it will be noted, are now on a parity with last year, Havre's figures, in fact, are 4,500 bags less; but taking London, Liverpool, and Havre together they work out as follows:—

	1911.	1910.	1909.
Havre, August 31st ...	275,182	279,691	218,950 bags
London, September 2nd	117,735	92,815	111,054 ,,
Liverpool, August 31st...	12,454	10,898	5,007 ,,
Totals	405,371	383,404	335,011 ,,

Here are the details:—

Havre Stock, August 31st.—	1911. Bags.	Value. Fcs.	1910. Bags.	Value. Fcs.
Pará	22,065	72 to 76	34,215	66 to 70
Bahia	22,633	70 ,, 78	26,792	60 ,, 65
Venezuela	54,884	76 ,, 175	61,952	68 ,, 150
Trinidad	47,128	75 ,, 78	59,153	66 ,, 69
Grenada and other W.I. ...	5,834	67 ,, 76	5,151	59 ,, 67
San Thomé	18,810	75 ,, 77	9,598	64 ,, 66
San Domingo	10,416	66 ,, 70	14,010	56 ,, 61
Haiti	9,411	56 ,, 72	18,103	49 ,, 64
Accra	45,635	66 ,, 70	15,238	57 ,, 62
Guayaquil	14,373	72 ,, 82	8,618	67 ,, 82
Others	23,993	—	26,861	—
Total	275,182 bags		279,691 bags	

London, September 9th—	1911. Bags.	1910. Bags.
Trinidads	8,544	10,126
Grenadas	14,137	11,802
Other W.I.	8,341	5,150
British West Africa ...	4,109	3,373
Portuguese West Africa ...	4,738	1,222
German West Africa ...	5,848	1,827
Ceylon and Java	16,912	15,691
Guayaquil	38,444	31,399
Brazil and Bahia	1,611	1,166
Other Foreign	12,218	12,012
Totals ...	114,902	93,768

The circumstances surrounding the market have been as exceptional and of so purely a transitory character that, beyond reporting the rise, it would be misleading to enlarge on the causes. The question of the San Thomé-Bahia valorization scheme is still discussed, both by the public and those immediately concerned. A large "bear" account that had to be covered in Hamburg seems, however, to have been the more immediate cause of the spurt. Crops, according to the latest figures available, work out as on p. 192. The returns of the San Thomé receipts at Lisbon to the end of August vary from 272,487 bags (Alleaume) to 375,662 bags in one of the prices current sent out from Mincing Lane. The figures given below are from Messrs. Martin,

Weinstein and Co., of Lisbon, who, being on the spot, really ought to be reliable.

		1911.	1910.	1909.	
Trinidad shipts.,	Oct. 1st.-Aug. 21st	244,243	282,832	259,452	bags
Grenada ,,	,, ,,	65,237	72,824	66,558	,,
Guayaquil receipts,	Jan.-Aug.	576,300	504,900	515,300	qtls.
San Thomé, (Lisbon receipts)	,, Aug.	310,653	296,529	260,670	bags
Gold Coast ...	,, July	18,490	11,780	9,809	tons

The twelve months' export from the Gold Coast last year amounted to 23,114 tons, and with improved transport facilities this amount can be considerably increased.

Turning to the consumption, our own Board of Trade figures for August are disappointing, as we have a smart set back to report for the month which the strike in London and Liverpool does not altogether account for. The deliveries for consumption throughout the United Kingdom in August were 1,565 tons, against 2,057 tons last year, and 1,760 tons in 1909. This has caused the eight months' figures to work out at the following :—

Raw cocoa only—	Landed.	Del'd. H.C.	Export.	Stock (Aug. 31st)
Jan.-Aug., 1909—	24,912	15,694	4,240	10,021 tons
,, ,, 1910—	21,492	14,981	4,619	10,594 ,,
,, ,, 1911—	23,832	15,855	4,399	13,146 ,,
	Incr. 2,340	Incr. 874	Decr. 220	Incr. 2,552 ,,

The comparative deliveries for consumption at the four chief centres, according to the latest figures, are as follows :—

Jan.-July—	1911.	1910.	1909.	
Germany ...	30,866	26,122	24,194	tons (English).
France	15,190	13,605	13,045	,, ,,
U.K.	14,288	12,924	13,934	,, ,,
	60,344	52,651	51,173	,, ,,
Jan.-June— Add U.S.A. ...	38,111	27,994	34,146	,, ,,
Comp. Totals	98,455	80,645	85,319	,, ,,

Values, including the sale, on September 19th run as follows ; where sales have not been made since September 1st I have placed the comparative values :—

Trinidads.—Fine marks are quoted nominally at 64s., superior 65s., good to fine good red, 62s. to 63s.

Grenadas.—After touching 61s. and 61s. 6d. cannot now be valued at above 60s., whilst common unfermented to fair fermented last sold at 56s. to 57s.

Dominicas.—Good marks after realizing 60s. are now worth up to 59s., and common unfermented to fair fermented 53s. to 54s.

Jamaicas rather drag. A nice lot realized 61s. and a lot of good red clayed sold at 60s. 6d. on September 5th, but other lots seem difficult to sell.

St. Lucia.—Fine should be worth 59s. to 60s., the same as Grenadas, as it also sold last month up to 61s. 6d., and fair reddish recently fetched 58s.

Surinams are worth 57s. to 61s. for fair to fine.

Samoa.—Good bold sold at 74s. to 75s., against 76s. 6d. to 78s. for good to fine bold on August 30th.

Costa Rica.—Good greyish sold at 58s.

Honduras.—Good fermented red sold at 59s. to 59s. 6d.

Java.—Good bold 74s., fair medium 65s.

Guayaquil.—Superior summer Arriba sold at 64s., rather lower quality 62s., Caraquez 57s. to 59s., Manta 58s. 6d. to 59s., Tumaco 52s. 6d. to 55s.

Ceylon.—Fine 77s. to 79s., good estate 65s. to 70s.

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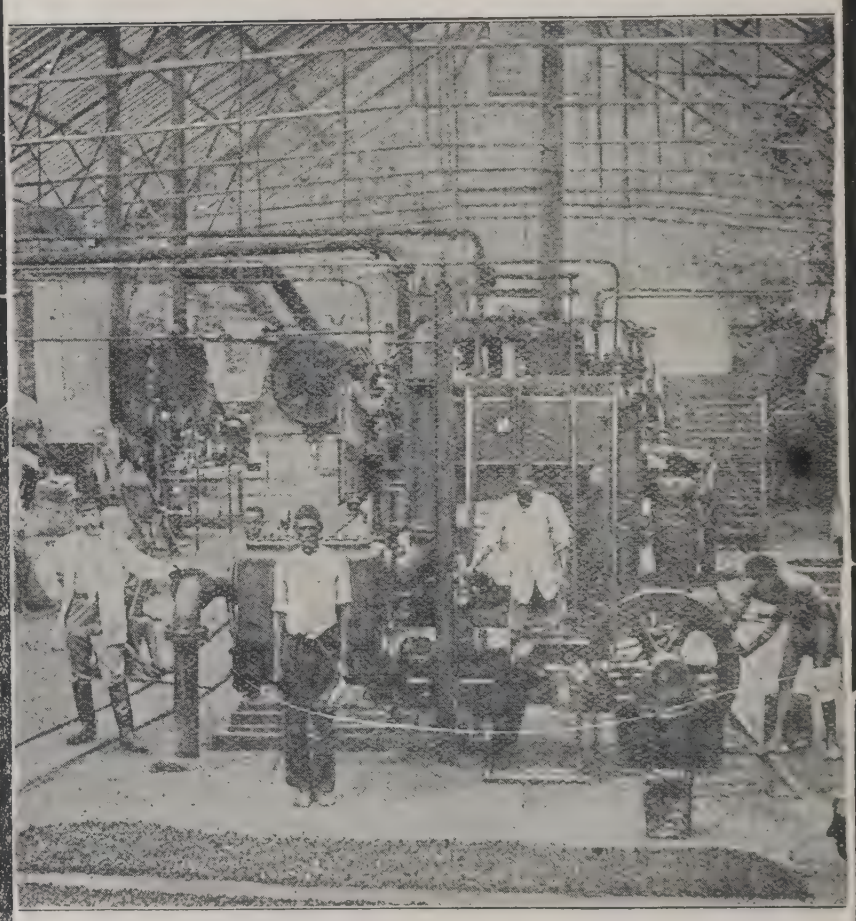

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Editorial Notice.

OWING to the demand for back numbers of TROPICAL LIFE having nearly exhausted our reserve copies, we have been obliged to make new arrangements, and amend our prices. In future the price of back numbers of the current year will be one shilling each, as before, but those dated previous to the January of the current year will be eighteen pence (1s. 6d.) each. Bound volumes, however, of any year will remain at 12s., post free, as before. Since we started we have published 16 articles on coco-nut cultivation, coprah, &c., the same number on sisal, about a dozen on Manihot rubbers, four on palm oil, and, of course, a large number on cotton, cacao, and Pará rubber.

The British West African Association.

MEMBERSHIP DOUBLED IN SIX MONTHS. THE LABOUR QUESTION DISCUSSED.

IN our April issue we included a photograph and a short account of the inaugural dinner of the British West African Association, which, although called into existence thanks to the energy and foresight of Mr. Newland in October 1910, was unable for many reasons to celebrate the event at an earlier date. The April dinner, however, was voted a complete success, and all present congratulated Mr. Newland on the results.

This was six months ago; since then the Association's membership has been doubled, and an increasing number of new names are put up for ballot and election every month. Not unnaturally therefore, it was agreed that, as October 1 was the first anniversary of the founding of the Association, it would be as well to hold a birthday dinner to mark the event. The increased demands on the time of the Hon. Secretary (Mr. Newland) since the previous dinner, had caused the council to ask Mr. W. H. Boyle, F.R.G.S., a leading authority on West Africa and its commerce, to act with Mr. Newland as joint Hon. Secretary. Mr. Boyle agreed to do so, and immediately set to work to extend and add to the Association's exhibit at the White City, next to the St. Lucia (W. I.) stand in the Machinery Hall, with the most satisfactory results to the Association

Therefore, in arranging to hold their birthday dinner the Council and the two honorary secretaries felt that they had something to show for the money spent since they had made a start, and the speeches made at the dinner confirmed this opinion. In the absence of Earl Cowley, the President, the chair was again ably filled by Sir W. H. Lever, Bart., as Vice-President, who received numerous congratulations from those present on the baronetcy bestowed on him by his Majesty since the last dinner.

Among those present we noticed Major Searle, F.R.G.S.,

Mr. White, (Messrs. Rose, Downs, and Thompson), Mr. Crellin, (Elder, Dempster and Co.), Messrs. Stuart R. Cope, Herbert Underwood, Alfred Chandler, A. E. Heron, Frank Evans (Trinidad Agric. Dept.), José Pella, (correspondent *La Voz* of Fernando Po), E. G. Salmon (*Rubber World*), J. Darnley Taylor, (Francis Shaw and Co. Ltd.), A. E. Bonaparte Wyse, Frank Braham (interested in Liberian Rubber), Leo Weinthal (*African World*), Frank Kovachi (interested in Egypt), &c.

Sir Francis Fleming, K.C.M.G., who worked long and arduously for his country in Mauritius, the West Indies, Ceylon and Hong-Kong before he was appointed Governor, first of Sierra Leone, and, in 1895, of the Leeward Islands in the West Indies, was the principal guest, and in the course of his speech wishing the Association long life and prosperity, he very properly contrasted the attention these important colonies are now receiving with that meted out to them in former years. The future prosperity of West Africa, as with every other producing centre, largely depends on the quality and quantity of its labour supply, and of this Sir Francis Fleming spoke well—"I have," he told those present, "spent many years of my life in the West Indies, in Ceylon, and other parts of the Empire, but I can still say that I have always found West Africa the most interesting. Those who charge the native there with laziness, either do not know him or cannot manage him, for when well treated he will work well; but in order to achieve the best results with such raw labour, it is necessary to exercise discrimination in the selection of men sent out from this side to take charge, either as officials, planters or merchants."

Sir William Lever, as usual, spoke hopefully of the tropics, and again emphasized their growing importance as producing centres for food and raw materials for temperate zones—tea, coffee, cacao, tobacco, rubber, cotton, oils, sugar, &c., &c.; and he pointed out the benefits tropical development would confer on natives and whites alike, provided the lands were secured, planted up, and developed along right, fair and up-to-date lines. Colonel Weston also spoke confirming Sir William Lever's and Sir Francis Fleming's remarks.

Mr. Osman Newland, answering for the Association, reported excellent progress in all directions, *i.e.*, increased membership, more central offices, improved financial position. He referred to their important exhibit at the Coronation Exhibition, for which success they owed much to the energy of Mr. W. H. Boyle and the liberality of Sir William Lever. The Association also, thanks to another member, Mr. W. Andrews, could boast of a luxurious suite of rooms on the first floor in the principal building in the Poultry, viz., in Revenue House, almost next door to the Mansion House, Bank of England, and Royal Exchange, that is to say in the centre of what has truly been described as the "Hub of the Empire," and through that of the world. Small wonder, therefore, claimed Mr. Newland, that the membership had been doubled within the last six months, and was still rapidly increasing.

The editor of TROPICAL LIFE proposed the health of the Visitors, and spoke of the advantages of such gatherings for enabling those present to compare notes with old friends and new ones from other producing centres as to the methods to be employed and the progress each were making. It also enabled the members to discuss unofficially with those at the head of affairs in the Colonies such matters as the need of improved transport facilities, of a re-organization of the labour available, and other items about which it would be difficult for the ordinary trader and merchant to reach the ear of the Colonial office, or those sent out by that Department to act as governors or in other leading posts in the Colonies. Mr. Braham, who is about to publish a book on rubber, and who has had, we believe, nearly twenty years' experience on the coast, replied. Mr. J. Halcrow, F.R.G.S., then proposed the health of the Chairman, and Sir William Lever's reply brought to a close what was unanimously voted as having been one of the most successful functions those present had attended.

We understand that on the invitation of Sir William and Lady Lever, the Association are arranging a conversazione at The Hill, Hampstead, Sir William Lever's town residence, for October 24.

STUDENTS of social problems who do not know of the bound volumes of *Truth's* short stories, published periodically at 1s. each, would do well to ask for a copy next time they are near a railway bookstall or their pet bookseller. Written possibly to amuse, there are but few of these tales that do not leave a good deal behind for the mind to ponder over even with the more frivolous natures, and whilst they can hurt no one's feelings, everyone, be they well-to-do or in straitened circumstances, will know and recognize the class of character depicted, and even see themselves or their best friends quite faithfully portrayed in some of the sketches. London life is not so dull now as it used to be twenty or twenty-five years ago, and those of us who must of necessity speed along in advance even of this wide-awake age, can often gain timely glimpses of the pitfalls that they may stumble over, if not be lost in altogether, by reading these stories.

Another publication, this time a monthly magazine, that strongly appeals to us in the same way, comes from across the Herring Pond and is known as *Current Literature*, published by the Current Literature Publishing Co., of New York, 134-140, West 29th Street, price $3 a year. It is not unusual for the section in this monthly devoted to "Music and Drama" to review a play based on one of the social questions, especially in connection with the employment of girls and young women in large establishments, showing the life they lead, and what they have at times to put up with. This has very cleverly been done in many ways, as by Mr. James Forbes in "The Chorus Lady," Mr. Eugene Walter in the "Easiest Way," and now in their October issue we have a still more forcible example by Charles Klein in "Maggie Pepper," the story of an attractive girl in a big departmental store. All these reviews leave much behind them to think about, and, to our mind, show the increasing evil of people, whether wealthy or poor, being squeezed up and hustled up more and more in a few large centres, as is being done, instead of living healthy, natural, more out-of-door lives spread about out in the country or abroad. Short pertinent articles are also included each month on American politics, finance, arts, crafts, literature, &c.

The Castilloa Industry in Mexico.

We are indebted to Mr. Harry S. Smith, of Caledonia Estate, Tobago, for the following very interesting illustrations of some Castilloa and cacao trees he met with during his recent trip through Mexico, which the owners or managers of the various estates were kind enough to let him photograph.

It will be remembered that Mr. Smith went, *viâ* New York, to Vera Cruz, arriving there on October 18th last. He then proceeded to Tuxtepec, which he found to be quite a "rubber" village, with Castilloa trees planted in everyone's yard. Many of the trees were very old, one measuring 156 in. in girth 3 ft. from the ground. The trees are not bled by the owners, but by native tappers, who pay a small amount for the privilege. Large V-cuts, about a foot apart, extending almost round the tree, are made with the machete, a portion of the bark being cut away to form a rough channel for the latex. All the trees are chopped from the base to the upper branches in this way once a year.

From Tuxtepec, the traveller went to San Cristobel de la Vega Estate, some thirty-five miles further up the river, where he again found some very large trees, one of which also measured 156 in. in girth. We are able to show a photo of this tree.

On the "El Palmar" Estate, Tezonapa, an estate of which Mr. Smith spoke in the highest terms, he found a striking example of the great vitality of the Castilloa tree among congenial surroundings. As can be seen by our illustration, No. 2, three trunks of large and tappable size have grown up from the one fallen tree. Starting as suckers, two at one end, and one at the other, these three, with some care and attention, developed to the proportions seen, all coming to well beyond a tappable girth.

Illustration No. 2.—Three in One.

View showing the strong vitality of a Castilloa tree on "El Palmar" Estate, Mexico, three tappable trunks having grown up from the fallen tree.

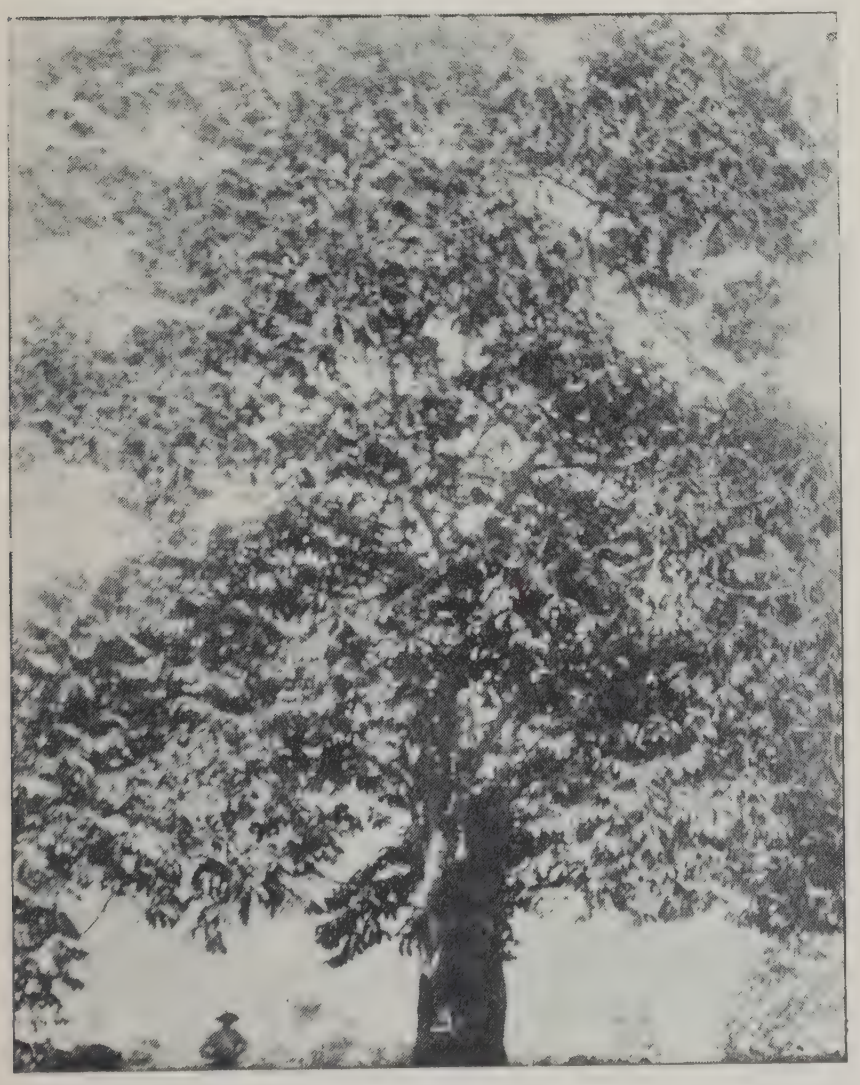


Illustration No. 1.

Large Castilloa tree on San Cristobe de la Vega Estate, Mexico. Girth at mark ⌋ = 156 in.

On reaching Mastepec, in the Tonola Department of Chiapas, "El Rosario" was reached. This is a young estate where vigorous growth is evidently the order of the day, although the close planting, which probably tends to encourage this excessive growth, is detrimental, we consider, to the bearing capacity of the trees in the end. Notwithstanding their early rapid growth, "trees of from 6 to 8 years old do not," Mr. Smith finds, "exceed, on an average, those in Tobago in girth, and nowhere in Mexico did I see trees, age for age, to equal those which we have wide planted with cacao." (See illustration No. 4 on page 196.)

We include our next illustration, No. 3, to show the enormous development of the surface-feeding roots of the Castilloa, as compared with the ridiculously small tap root (marked with an arrow). This tree grew on the "Donna Maria" estate, in Soconusco, which has deep rich soil, going down to a great depth, perhaps 20 ft. and more, so that if the tree was to develop a large tap-root, it had every reason and inducement to do so here.

This illustration shows that even in such deep, rich well-drained soil as that of the Chiapas Plain, the Castilloa tree is not a deep feeder. Mr. Smith here shows, on the contrary, that the surface roots develop until they more than equal the trunk itself in girth, whilst the tap-root remains insignificant in comparison. Whilst the girth of the trunk, 3 ft. above ground (see +) was 62 cm. (24½ in.), that of the large surface root, shown at spot also marked with a cross, was 79 cm. (31 in.).

After leaving El Palmar, through which he went

ILLUSTRATION No. 3.

A fallen Castilloa tree on the well-known "Dona Maria" Estate, Mexico. Note the size of the large surface-feeding root up in the air, compared with trunk resting on the bank. Whilst the root measures 31 in. in girth at the spot marked with +, the trunk measured at its + only 24½ in. The tap-root (pointed at with arrow) is quite insignificant in comparison.

ILLUSTRATION No. 4.

Photograph showing the vigorous growth of young Castilloa in Mexico. The above tree was planted "at stake" in the sun, and was 17 months old when photographed. At that time it stood 17 ft. 8 in. high, and 12 in. in girth at 3 ft. from the ground.

with the visiting agent in the person of our friend, Mr. J. C. Harvey, whom we were glad to see at the London Rubber Exhibition, a few days were spent together on Mr. Harvey's own estate, "La Buena Ventura," at Sanborn, Vera Cruz, where the Castilloa trees were carefully examined. It was, however, Mr. Harvey's cacao trees, perhaps, that mostly attracted Mr. Smith's attention, on account of the beautiful quality (colour, break, size, and aroma) of the beans. We had already received a sample of this cacao, and showed it at the Rubber Exhibition. Those who were competent to judge valued it at "anything over 85s.," with fine Ceylons at that price.

A peculiarity that the visitor remarked in the cacao

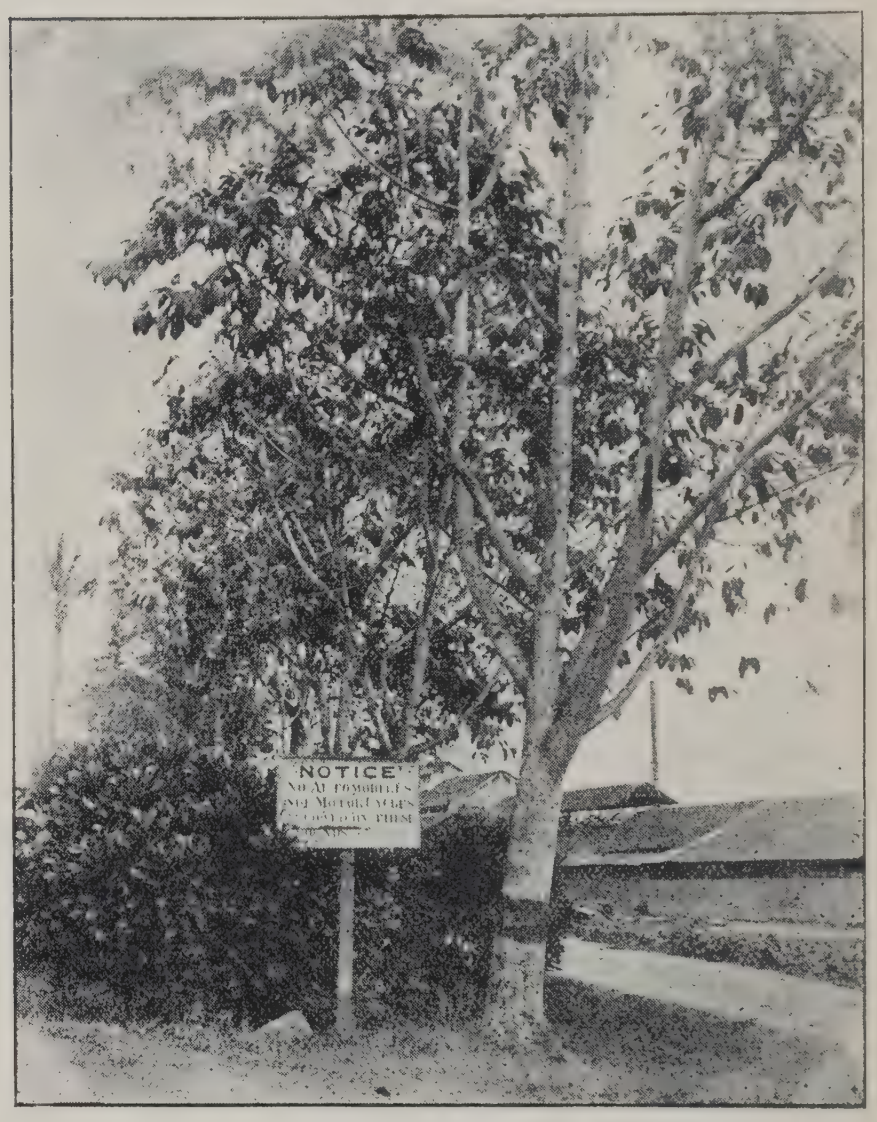


ILLUSTRATION No. 5.

A Castilloa tree, but not *C. elastica*, in Panama. Compare its method of branching and its leaves with Illustration No. 4.

trees on "La Buena Ventura" was the branch growth as compared with the well-known "horqueted" trees in the West Indies. "I was interested," Mr. Smith said on page 4 of this report, "to see that 95 per cent. of the trees had quite a different branch system to the trees we have in the West Indies. Looking at a nursery of young plants, one would think that the tips of a number of branches had been cut off and planted. These plants do not *fork*, but when the tree is about 4 ft. high, it sends out fan-like branches from about a foot below the growing tip, which tend to balance the tree. This peculiar growth continues, and the trunk of a mature tree is a long way off the perpendicular. Given plenty of room these trees do not require much prun-

ing, as they do not throw out suckers, the shoots coming forming only branches. The pods are moderately thin-shelled, and shaped like *Criollo;* the break of the uncured bean is white."

Leaving Mexico, Mr. Smith reached Guatemala and Panama. In Panama he met with a number of mature rubber trees, different to the Mexican *C. elastica*, both in regard to the shape and size of the leaves and the method of branching. These characteristics can plainly be seen in the last of the photographs, No. 5, here shown.

"There are a number of mature trees, said to be about 25 years old, in the grounds of the Ancon Hospital, of a different variety to the Mexican Castilloa," we are told. "These were planted by the French when they were working at the canal, and from the general growth, both here and in the other districts of Panama, it would seem to be a smaller variety, and it is the exception to see the branches spread out almost horizontally, which is so characteristic of the Mexican tree. The latex of this variety does not flow freely at any time, and on the tree being tapped, it oozes out and quickly thickens, having to be scraped off, or left to coagulate as scrap. I noticed plantation trees of about 20 years old that had been repeatedly tapped, when the owners, knowing the latex would not run down, had made the cuts horizontally, with no attempt to centralize it."

Our readers will agree with us that our best thanks are due to Mr. Harry S. Smith for placing at our disposal so interesting and instructive a set of photographs, with particulars of same.

Reviews.

The Year Book of The Louisiana Sugar Planters' Association. Compiled and published by the Association for the Information and Use of its Members. 65 pp. Price 6s. 6d., post free. New Orleans, La, U.S.A., 339, Carondelet Street.

As we stated some time back in Tropical Life,* no one interested in or associated with sugar can let his mind wander back across the vista of Louisiana's sugar-planting history, if he knows anything about it, without "thinking a great think." We have never been near Louisiana, but for all that it was a real pleasure to us simply to run down the list of names in this book, and associate them, or fancy we could do so, with those who helped build up her industries when France owned Louisiana and the Americans first obtained her by purchase. The book is admirably put together, and arranged to give all the details required, with the least trouble and loss of time. It starts with an index to proprietors of sugar factories in Louisiana—nearly 220 in all; then we are given a sort of "Who's Who," in the shape of a series of paragraphs *re* these same estates—their area, cultivated and uncultivated, crop, machinery, names of owners, managers, engineers, together with date of crop, &c., &c. Thus we are told: "Glenwild Estate is owned by J. N. Pharr and Sons, Ltd., who operate the Fairview Plantation in connection with it. Post-office, express office and telephone address, Berwick, La. Telegraph address, Morgan City. Shipping address by water, Gendwild Landing, Bayou Teche. Shipping address by rail, Berwick Station, Southern Pacific Railroad. Grew 14,935 tons of cane in 1910 and purchased 35,733 tons, grinding altogether 50,668 tons, and produced 8,652,460 lb. of sugar, of which 8,232,524 were 96 test, and 419,926 lb. were seconds. Molasses, 247,351 gals. The place is situated on the west bank of Bayou Teche, in St. Mary Parish, and the factory has a 6ft. 9 in. roller mill, with 6½ ft. crusher, with vacuum pan and triple effects. J. A. Pharr is president of the Company, H. W. Pharr vice-president, George Watkins chief engineer, W. E. Dickinson, head chemist. Began grinding October 26th, and ended December 31st." All the other estates are reviewed along similar lines. The third and last section is devoted to giving a list, with names and full addresses, of the larger cane growers, and of the sugar manufacturers, arranged according to parishes, as Pointe Coupée, West Baton Rouge, Plaquemine Parish, and so on. Anyone interested in sugar producers and manufacturers in Louisiana could not possibly find a book better arranged and more useful for reference.

* April, 1910, "The Romance of the Tropics."

The Sugar Industry of Mauritius. A Study of Correlation. By A. Walter, F.R.A.S., Chief Assistant Royal Alfred Observatory (Mauritius). 228 pp., including index. Many photographs, sketches, &c. London, Arthur L. Humphreys, 187, Piccadilly, W. Price 2s. 6d. net.

In these days of universal insurance when a man can, at least in England, insure his children from birth, and even himself against his family coming along by twos and threes, we cannot help feeling that planters in the tropics do not protect themselves to the same extent as the folks do at home. With the rapid planting up of the tropics on all sides, however, much more attention is being given to the matter of insuring crops and estate buildings in theory if not in practice, and in a very few years we feel that the question of agricultural insurance will be as general throughout the tropics as it is at home.

On this account we were pleased to meet Mr. Walter's book, particularly the part devoted to a scheme of insurance of the cane crop against damage caused by cyclones. The book is an outcome of investigations undertaken originally with the object of determining the values of the correlation coefficients between the sugar-cane crop of Mauritius and certain of the meteorological elements, and will, we trust, be widely read and lead to a much more general adoption of crop insurance among planters of all descriptions. The reports include the effects of climatic changes, and especially of violent changes, on the growth of sugar-cane, and so can equally well be studied by planters of cane in U.S.A., Formosa, West Indies, &c., as well as of rubber, cacao, &c., for although such men are, as a rule, but not always, out of the danger zone, the insurance problem, the same as the questions of manuring, irrigation, pest extermination are common to all crops, and must be adopted by all alike in the end. Having called attention to the book, we hope to discuss the various subjects treated, as insurance, irrigation, and droughts, &c., in special articles at no very distant date.

Messrs. Crosby Lockwood and Son will shortly be issuing "The Rubber Planter's Note Book," by Mr. Frank Braham, F.R.G.S., who has had many years' experience in tropical producing centres. Mr. Braham's idea is, we understand, that the book will serve as an illustrated manual of Pará rubber growing and preparation, especially designed for use in the field. Some notes on the maintenance of health in the tropics and other general information of utility to the rubber planter will be included. The book will be illustrated, and cost about 2s. 6d., but the price is not yet fixed.

The Niger and the West Sudan: the West African's Notebook. By Capt. (now Major) A. J. M. Tremearne. 151 pp., including 20 pp. of appendices. Price 6s. London: Hodder and Stoughton, Warwick Square, E.C.; or Tropical Life Publishing Department, 83-91, Great Titchfield Street, London, W.

This is a most interesting book. We are glad that it contains only 150 pages, otherwise it would have caused us to spend more time over it than we could afford, studying the history of the settlement and development of the African Colonies since the time of the Phœnicians in 600 b.c., and the formation of what was probably the first African Association, by five young Nassamonians, as related by Herodotus. No doubt the youngest of such bodies, viz., the British West African Association, of which Major Tremearne is a distinguished member, will, in the near future, do as much to open up and make Africa known as did the intrepid Nassamonians 2,500 years ago.

The book is aptly described as a vade mecum containing hints and suggestions as to what is required by settlers, traders, or visitors in West Africa. After various chapters dealing with these necessary and practical hints, we have lists of suggested kits, their cost, &c., and general information required by those going to West Africa, together with a description of the Hausa language, and a list of words, phrases, &c., in common use when talking or bargaining with the natives. The author is well qualified to publish such a book, as he is Lecturer and late Hausa Scholar, Cambridge, and has already published books on the Hausas, including "Notes on Some Nigerian Head Hunters," "Fifty Hausa Folk-tales," &c. All those visiting, or who are interested in West Africa, will find the book as useful as it is interesting, and it certainly is very interesting.

The Irrigation of Mesopotamia. By Sir W. Willcocks, K.C.M.G., F.R.G.S., Adviser to the Turkish Ministry of Public Works, Constantinople. 136 pages, with 42 large plates and plans issued in a separate portfolio. Price 20s. net. London: E. and F. N. Spon, Ltd., 57, Haymarket; or Spon and Chamberlain, 123, Liberty Street, New York, U.S.A.

To anyone, in any part of the world, interested in irrigation and the application of flood or other waters to the land on a large scale, this work should prove a valuable ally. The lessons to be learnt from the plans and diagrams alone are worth the closest study by those who depend on means other than rains to refresh their crops; whilst to the planter in Egypt and the near East they will prove invaluable.

Of the book itself, the special chapters in the appendix are by no means the least useful portion. These include such subjects as "The Agricultural Possibilities of Mesopotamia," by Mr. G. P. Foaden, formerly head of the Khedivial Agricultural Society; "The Meteorology of Mesopotamia," by the late Sir John Elliott, K.C.I.E., Director-General of the Meteorological Department of India; "Analyses of Soil and Water," by Mr. Frank Hughes, F.C.S., of the Khedivial Agricultural Society, &s., &c.

The report on the irrigation scheme itself pays for careful studying, as it shows us the causes of some of the barren spots of the earth, and explains why it is they have been there for centuries, a living reproach of how men in the past neglected and abused the gifts of nature until she, losing patience, withdrew the riches and plenty she was willing to offer, as if to preserve them for more worthy generations in the future—for the present generation maybe, thanks to the authorities who voted the funds, and to Sir Wm. Willcocks and his able staff, who have done so much with the funds at their disposal to bring back the prosperity and fertility of a bygone age. Those, therefore, who, being placed under similar circumstances to those owning land at the junction of the Tigris and the Euphrates, wish to copy what has been done in Egypt and Mesopotamia, cannot do better than add Sir Wm. Willcocks's book to those they already possess. Details of cost of such work are included, as in Appendix N, pp. 110-131—earthwork, masonry, concrete, excavations, &c.; or Appendix on pp. 95-106—cost of labour, materials, transport, making bricks, machinery, &c.; all are there for investigation and comparison.

We missed the genial presence of Dr. Spence at the Rubber Exhibition this year. Dr. Torrey was there, and rendered valuable services in acting as chairman at the congress meetings, as Dr. Spence did in 1908. The latter, however, in Akron, U.S.A., like Dr. Torrey up at Liverpool, is still doing work of the utmost importance to the rubber producing and manufacturing work. We were recently reminded of this by the receipt of four valuable articles, written by Dr. Spence, either alone or in collaboration as under:—

"Zur Bestimmung des Kautschuks nach Budde." (I.) "Mitteilung—Einfluss des Proteins bei der Bestimmung," by D. Spence and J. C. Galletly. (II.) "Mitteilung—Zersetzung des Bromidsdurch Salpetersäure," by D. Spence, J. C. Galletly, and J. H. Scott (ex *Technische Monastschefte*, Hamburg, March, 1911); "Beitrag zur Chemie des Kautschuks. Theorie der Vulkanisation," by Dr. Spence and J. H. Scott (ex *Zeitschrift für Chemie und Industrie Kolloide*, Part VI., volume viii); "Sur la détermination du caoutchouc comme tétrabromure. Décomposition du bromure par combustion avec le carbonate de soude," by Dr. Spence and J. C. Galletly (ex *Le Caoutchouc et La Gutta-Percha*, Paris); "On the action of the Chromyl Chloride on India Rubber," by D. Spence and J. C. Galletly (ex *The Journal of the American Chemical Society*, vol. xxxiii, No. 2, February, 1911). 1911).

Circular No. 3 issued by the Board of Agriculture, Trinidad, contains 25 pages of useful information on insects affecting cacao, rubber, &c., based on observations made during 1910-11 by Mr. P. L. Guppy, the Assistant Entomologist. Miscellaneous notes on various pests by the Entomologist (Mr. F. W. Urich) are also included, and refer to ants and rats on cacao estates, &c. Those interested in the extermination of these pests will find this publication of use.

The Department of Agriculture, Trinidad, of which Professor Carmody is Director, and Mr.W. G. Freeman (formerly of the Imperial Institute) Assistant Director, has issued, as their Circular No. 11, "Short Hints on Cacao Cultivation for Peasant Proprietors," by Mr. D. C. Plummer, one of the agricultural inspectors attached to the Board of Agriculture. Mr. Plummer's chatty advice is excellent, and we hope those who read his circular will follow it. "Keep things clean," he tells us. "Squirrels and rats do not like clean cacao estates; they like dirty, unkempt places." Previous circulars issued by the Department have been: No. 1, "The Use of Bordeaux Mixture"; No. 2, "The Carpenter Bird, and Cacao"; No. 3, "Courses in Practical Agriculture"; No. 4, "Strongylus Parasites in Cattle"; No. 5, "On Spraying Froghoppers"; No. 6, "The Froghopper Fungus"; No. 7, "The Improvement of Sea Island Cotton by Hybridization"; No. 8, "Study of the Froghopper during the Wet Season of 1910"; No. 9, "The Palm Weevil as Sugar Cane Pest"; No. 10, "Special Cotton Seed."

A healthy, clean-living man, Mr. Louis P. Bowler tells us in his book, "Gold Coast Palaver" (John Long, 2s.), can live perfectly well in this country (the Gold Coast) if he is abstemious in eating and drinking, treating spirituous liquors as a medicine and not as a beverage. For my own part, I consider, he tells us, that total abstinence from alcoholic liquor is the safest mode of living. Get as much fresh meat, fish, eggs, poultry, milk, farinaceous food, veegtables and fruit, and curtail the living on tinned food as much as possible, for the metallic irritant poisons in tinned goods upset the stomach and assist attacks of malarial fever more than anything else. The *Daily Telegraph* gave the book a very favourable review, and calls attention to Mr. Bowler's belief that if a good fish-curing industry were started on the coast, it would soon yield a profit of over £40,000 a year.

Our well-known contemporary, the *Bulletin de l'Assoc. des Planteurs de Caoutchouc*, of Antwerp, has taken the opportunity of celebrating the leading part that Belgium played at the London Rubber Exhibition of 1911 by issuing a special number containing their report of the Show, and the various events, official as well as social, that took place, especially those held in connection with the Belgian Committee and the extensive court of exhibits of which it had charge. Running into nearly 50 pages, and illustrated with over 60 photographs of those who took a leading or official part in connection with the exhibition, of the exhibits themselves, or of views from the producing centres, the whole forms a pleasing and useful souvenir of the occasion from a rubber producer's point of view.

The Cult of the Coco-nut.

Whilst everyone has heard of the fame of the San Blas nuts, few are certain where San Blas is (most of my enquiries have located the centre in the Philippines, but none of them in Panama, where it really is), and so are unable to address themselves to possible sellers of seed-nuts to improve their local supplies. Like the well-known though less famous cocals in the West Indian island of Trinidad, the San Blas nuts come from the sea-shore of what is known as the San Blas coast of Panama. From this centre the United States alone, according to the *Pan-American Bulletin*, take some 6,000,000 nuts, which sell on the New York market, where the nuts are reckoned as being the finest in the world, at prices ranging from $33 to $45 ($1=4s. 2d.) per thousand.

Coco-nut planters, therefore, who are not satisfied with the size of their nuts, would do well to get into touch with shippers or planters along the San Blas centre in Panama, and import a supply of seed-nuts from this centre, which has not only been noted for its coco-nuts for generations past, but has also, of late, added new plantations which, together with the older ones, are carefully looked after. All who have spoken to us of San Blas nuts describe the centre as being perfectly free of disease, but this we cannot vouch for from personal experience.

Regarding the output of coprah in the South Seas, the *London Chamber of Commerce Journal*, the other day, reported that the principal coprah-producing country, after India, is the island of Samoa, where, by regulation of the native processes of preparation, it has been possible to double the production of this important article within ten years. Thus, in 1900 the annual crop was about 6,000 tons, and in 1910 it exceeded 12,000 tons. It is predicted that, within a dozen years, some 30,000 tons will be produced in the island of Samoa alone. At the present time the yield per acre is from 9 to 11 quintals. The production of coprah has also recently begun to extend in the New Hebrides, in the Solomon Islands, in Papua, and in certain of the Pacific Islands. All the coprah actually produced in these regions goes to Sydney, or passes through that port before being re-exported to Europe. Having regard to the constant development of the production of coprah, it is anticipated that Sydney will become one of the most important markets for this article in the world.

There is a possible, not to say a probable chance (says the *Manila Times*, quoting Dr. H. D. Gibbs) that the business of making sugar in the Philippine Islands may be entirely revolutionized. The advantages of the nipa product over those of cane lie in there being a practically inexhaustible supply of nipa trees located all over the Archipelago. Another feature is that, since the sugar would be produced from sap, the crushers in the ordinary sugar mill, which form one of the heaviest items of expense in the mechanical line, would be unnecessary. Another considerable item is that once planted, the nipa takes care of itself, that it requires no cultivation, and that its product may go on for a century. Trees which have been producing for half that time, fifty years, are already on record among unimpeachable authorities. The method of extracting the sap is

very simple, consisting of the native puncturing each tree, and drawing off the liquid in bamboo measures, day by day, this operation lasting for about an average of seventy days annually with each tree. Of course, the process of extraction can be carried on practically all the year, because different trees may be used in the same tract, thus keeping up the business all the year round.

The figures from the yield of one hectare, by a series of measurements, show that from 2,000 trees sufficient sap may be drawn to produce 10,428 kilos of sugar (say 10½ tons) of 96 per cent. polarization. At 16 centavos per kilo, a fair average value, this would bring a gross income of 1,668.48 pesetas, from which the expense must naturally be deducted.

Reference has been made principally to the nipa trees, but in addition there are also three other varieties of tree, the coco-nut, buri, and sugar palms, all of which produce sap suitable for sugar. The advantage of the transportation of sap over that of the heavy sugar-cane to the mills is of course plainly obvious, since the labourer merely steps from his banca to the shore, extracts the sap, pours his bamboo measures into some larger receptacle in the banca, and paddles away to the mill, one man being all that is necessary for the operation, and the building of railroads, as in the case of sugar-cane, being unnecessary for transportation purposes.

It has been estimated by the doctor and his assistants that an area of from 750 to 1,000 hectares of nipa trees would be sufficient to keep a 100-ton sugar mill running continually.

In addition to the sugar industry, there is also the production of alcohol, which can be made from the sap of the nipa tree in quantities sufficient to supply the entire China coast, beside what is needed for local consumption. Last year over 9,000,000 litres of alcohol were made from 90,000,000 litres of sap, and this is merely a small fraction of what might be done.

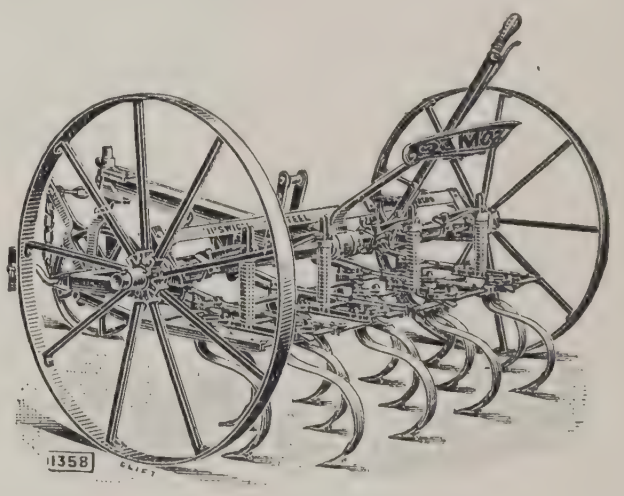
In addition to taking sap from the nipa trees for alcohol, coco-nut tree sap is largely used, and the scientists have demonstrated that the production of the coco-nut trees may be increased by over 112 per cent. by intelligent handling.

Experiments made with regard to the yield of sap from 100 coco-nut trees for a period of thirty-one days, with two collections per day, showed that the average daily production of sap per tree was approximately 1.4 litres each.

Whilst this is extremely interesting to hear of, we would say that such large withdrawals of sap must tell heavily upon the palms, and by reducing their vigour, decrease both the size and quantity of the nuts. In fact, such trees would, we feel, be useless for coprah-production—at least, when being systematically tapped as described.

We have received several inquiries from this side *re* cultivators for coco-nut grooves, arising out of our review of Mr. Dean. C. Worcester's pamphlet (pp. 179-180 of our September issue), and so will publish our answer in case others, out in the Philippines or elsewhere, want the same information.

"Most of the unforested lands," writes Mr. Worcester, "suitable for coco-nut planting in the Philippines is covered with the tall, coarse grass, known as cogon, or with a species of bamboo grass which closely resembles sugar-cane in appearance, cogon grass being by far the commoner of the two. In order to clean cogon land, the grass must first be burnt off, and the land must then be ploughed (a strong plough would be needed to withstand the root growth), and then harrowed repeatedly so as to get rid of the roots. If this is not done the cogon will promptly re-establish itself. If native ploughs and harrows are used, the land must be gone over four times the first year, and twice during the succeeding year." Our inquirers wanted to know what sort of implement could be used for cultivation work between coco-nuts, so we communicated with our friends at Ipswich, who recommended their "Ipswich" steel cultivator as illustrated. These implements are made with 8, 13 or 17 tines. They have *one* steel "through" axle and *one* lever for raising and depressing the tines. The wheels are of steel and the centres can be taken out and replaced by new ones, thus making them equal to new. A swivel-wheel is attached to a short pole, and takes all the weight off the animals, but a pole with whippletrees for either



The "Ipswich" Cultivator for Coco-nuts.

two or three horses, or both, can be fitted if desired. The tines are carried by hinged frames, and are free to follow all irregularities of the soil. When one end of the reversible steel points is worn they can be turned round and the other end used. The points have ribs on each edge to strengthen them, and require *one* bolt *only* to fix them. Self-sharpening chilled cast points can also be supplied, or steel hoes 5¼ in. wide. The patent taper spring steel tines are made of the best spring steel, and are strongest at the upper end, where the strain is greatest, no helpers being now required. The tines are tested to stand the roughest usage, and the pressure is applied through *spiral springs* instead of *flat pressure-bars*, thus giving the tines greater play; the pressure can be varied at pleasure to work fleet or deep, and the spiral springs make the leverage lighter. The tines can be moved sideways, and can be set with more or less pitch. On very foul land some of the tines can be removed to prevent clogging. All the weeds are brought to the surface and killed, and the soil is thoroughly aired and sunned.

In preparing the land for coco-nut planting, Mr. L. C. Brown, Inspector of Coco-nut Plantations, F.M.S., in his Bulletin No. 11, says that for the

first year, at least, it is preferable to keep the ground free from weeds, as doing so, among other advantages, causes the trees to come to maturity at an earlier stage, saves money in maintenance, and offers greater facilities for ploughing. He attaches great importance, we are glad to see, to seed selection when laying out an estate. We quite agree with him, and it was for that reason we call attention to the San Blas nuts. Mr. Brown reports that the seed nuts imported from Penang and Province Wellesley to some of the large coco-nut plantations in the Federated Malay States have done exceedingly well; although he adds that excellent nuts may be obtained from Kuala Selangor, Kuala Langat, and Lower Perak. Seed-nuts, we are told, should be selected from well-matured trees of medium size, say, from 25 to 30 years, showing good yield and large-sized *roundish* nuts, either red, brown or green, and not oblong nuts. The seed-nuts must be fully ripe, and care must be taken to ascertain that they are not damaged in any way.

In planting out the seed-nuts in the nurseries prepared for them, they should be buried to half their depth and placed in a slightly oblique position, with the acute end of the nut downwards. It is an advantage, concludes Mr. Brown, not to plant the seed-nuts for a month or so after they have been picked, so that the outer skin may get thoroughly dry, and the husk be allowed to harden. This must be to avoid pests, otherwise we should plant the nuts as quickly as possible after picking. The trees should be planted 30 x 30 (48 to the acre), and when the soil is alluvial and sufficiently above sea-level, Mr. Brown strongly recommends that Robusta coffee be planted 7 x 7 ft. as a catch crop, at the same time as the coco-nuts. When there is a good local demand for fruit, these can be planted instead of, or as well as the coffee.

Further orders are being received by the leading engineers on this side for mechanical dryers for tropical produce. The increased output of cacao, coprah, coffee, &c., at the chief centres is causing planters and shippers alike to turn to artificial methods of expelling the moisture expeditiously and completely as the parcels come to hand, whether they consist of only a few hundredweights or many tons. Among the orders recently received are two for Messrs. David Bridge and Co., Ltd., of Manchester, for their well-known rotary dryers. The first came from Fiji, the machine in this instance being, we understand, for drying cacao, whilst the other is for an apparatus to be shipped to the Philippines for drying coprah. Meanwhile the firm is quoting for these now popular machines for all the chief producing centres, including the West Indies, Bahia, West Coast of Africa, British and Portuguese Africa, Java, the Solomon Isles, &c., and hopes before very long to have one or more of their rotary dryers at work at each of these places.

In answer to "F. L. J.," we should recommend "Verb. Sap." (price 2s. 10d.) as the best book on outfits, cost of living and travelling in West Africa, and "The Maintenance of Health in the Tropics," by Prof. Simpson (price 2s. 10d. post free), for general information on the subject.

Tobacco Culture in England.

Successful Norfolk Experiment.

H.M. The King Interested.

According to the London *Observer*, Major G. F. Whitmore has growing on his estate at Glebe Wood, Methwold, Norfolk, under the first licence issued in this country under the new legislation dealing with tobacco culture in England, a most promising crop that gives every prospect of being the pioneer effort of a new industry for this country.

Many agriculturists in the district have been watching the enterprise with the greatest interest, with a view to taking up tobacco growing next year, and the Government some time since appointed an expert to make scientific inquiries as to the possibility of such an industry being taken up with success.

The plant has not yet attained its full growth, but it already measures more than 6 ft. in height, and has as many as twenty-eight leaves on its stem, which at its thickest part is $1\frac{1}{4}$ in. in diameter. The leaves, which are still green, are of fine texture, clean grown, and free from blemish, the largest being 20 in. long and 12 in. broad.

The land on which the crop has been raised has been regarded as of little value for cultivation, as it would not produce wheat, and for three years had not been cultivated. Major Whitmore, however, fancied the soil was similar to that on which in Asia Minor luxuriant crops of Turkish tobacco are grown. It is a fine, loamy sand that runs through the fingers, and water poured on to it runs about the surface like quicksilver, but at a depth of 3 or 4 in. signs of moisture are to be observed. This land is well sheltered by trees and belts of broom and gorse.

In April Major Whitmore had about one-fiftieth of an ounce of Turkish tobacco seed given him, which he sowed together with a larger quantity of Virginian Blue Pryor seed. The Turkish seed is extremely small, an ounce containing something like 300,000 seeds. The sowing turned out so well that from 1,200 to 1,500 plants were produced of Turkish tobacco, and 3,500 plants of Virginian.

The only preparation the soil has received for the crop has been a dressing of a special formula of artificial manure when the plants were put in. No expert has been employed to look after them, only a caretaker being engaged to do what was required.

Major Whitmore has sent a sample plant to the University Botanical Museum at Cambridge from his field, and later reports state that he had received a letter from the King, in which his Majesty said he desired specimens to be sent to Balmoral, and was pleased to know that Methwold is so near to Sandringham. Plants and leaves were therefore forwarded to Scotland. One leaf was over 29 in. long and $16\frac{1}{4}$ in. broad.

Mr. A. Staines Manders, Organizing Manager of the successful Rubber and Allied Trades Exhibition recently held in London, is now in America, and has cabled that a Rubber Exhibition will be held next September in the Grand Central Palace, a palatial building which has lately been erected in New York.

"Tropical Life" Friend.—No. 76.

Mr. Howard Newport, F.R.H.S., &c.

Instructor in Tropical Agriculture to the Queensland Government.

The name of Mr. Howard Newport is well known to those who, like ourselves, are interested in tropical and sub-tropical agriculture in Queensland. We are anxious to see this portion of the Empire take a more prominent part in its output of tropical products, particularly rubber, for it is a part that the Cape Peninsula (away from Ingham, and up through Cairns, 200 miles north, to the Torres Straits immediately opposite Papua) has been well qualified by Nature to play. It is true that on the East Coast the mountains hug the seashore a bit, but not too much surely, to prevent some nice cacao, coffee, and rubber plantations from luxuriating 2,000 or 3,000 ft. up, whilst coco-nuts will do well, we should imagine, right along the shore from a little south of Ingham up to the nose at Torres Straits, and down the West Coast to where Queensland borders on the Northern Territory that formerly belonged to Queensland, but it has now been taken over by the Federal Government. On the West Coast it may be flat and swampy, but a few miles of judiciously laid drains will go a long way to remedy this, and enable those who know how things are done in Malaya to come here and make a start. It may not prove a particularly "soft job," this planting up of tropical Queensland, but surely there are still some "toughs" left in Australia, as there are elsewhere, with the grit, enterprise, and capital to make a start. The natural and physical difficulties to be overcome are, we fear, not so serious as the native question. Those who imagine that the last Australian aborigine disappeared years ago will, we understand, soon find out, if he takes a journey alone through the Peninsula, that this is but another of many myths.

Major A. J. Boyd, Editor of the *Queensland Agricultural Journal*, is one of these energetic and capable men,* and "Our Friend" for this month is another.

Born in 1870, Mr. Newport, after receiving the typical English public school education, started his career as a planter in India at the juvenile age of 17. Being willing and capable he rapidly rose, and was soon placed by Messrs. Staines and Co., of Southern India, in charge of one of their largest estates. His experience in this part of the world included some pioneer work on the Pulney Mountains, where he inaugurated the local Planters' Association.

In 1898 Mr. Newport, having studied the life-history of the green bug (*Lecanium viridi*) of Ceylon on its first appearance in Southern India, and brought the matter of its depredations on coffee to the attention of the U.P.A.S.I., he was selected by them, in conjunction with the Government of Madras, to proceed to Australia to collect lady-birds and bring them over by the cold storage system, which unfortunately did not prove successful.

In 1899 Mr. Newport was offered and accepted an appointment as Instructor in Coffee Culture to the Government of Queensland, which was shortly converted into that of Instructor in Tropical Agriculture, which position he now holds.

He is stationed at Cairns, in North Queensland, in the heart of the rich tropical agricultural belt; and besides his instructional work and various other duties connected with his position as the only senior officer stationed in the far North of Queensland, some 1,000 miles distant from the Head Offices of the Department of Agriculture in Brisbane, he has control of the Kamerunga State Nursery, an institution for the introduction of tropical economic products into Queensland, and their subsequent propagation, acclimatization and distribution.

Mr. Newport's frequent articles on these subjects, dealing with rubber, coffee, cacao, vanilla, maize, kola nut, &c., as adapted to the conditions existing in tropical Australia appear regularly in the *Queensland Agricultural Journal*, and are often re-published in pamphlet form. Among these his "Rubber Cultivation of Tropical Queensland," a green-covered pamphlet of 16 pages, exclusive of 15 illustrations, on art paper, was in great request at the London Rubber Exhibition in July, where Queensland had an attractive exhibit of some size. His instructional work involves voluminous correspondence in reply to inquiries for information, visiting plantations, making selections and advising growers, also lecturing to associations, gatherings of settlers, students, school-teachers and scholars. As Tropical Agriculturist to the Government of Queensland, Mr. Newport has to face the various problems involved by the policy of the country which is the first in the world to attempt the settlement of tropical areas with a purely white population and carry on its tropical industries with white labour. The idea is a great one, but will it succeed? Up to now the progress has been very slow, far slower than we care to see.

* See "Our Friend" in Tropical Life, September, 1907.

Business Notices.

1.—The address of Tropical Life is Messrs. Bale, Sons and Danielsson, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All **literary communications** should be addressed **to the Editor,** and accompanied by the necessary stamps for their return if not accepted.

3.—All **business communications and payments**, either for subscriptions or advertisements, should be sent **to the Publishers** of Tropical Life. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is **Ten Shillings** per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed to the Manager of the Department.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

October, 1911.

The Colonial Bank and the West Indies.*

"Shareholder" writes us that "the Colonial Bank held its 147th half-yearly meeting on October 4th, when the new chairman, Mr. Edmund C. Morgan, had nothing new or of interest to tell the shareholders. The bank is still managed with an excess of care and caution, so that the present chairman, like his predecessor, the late Mr. Brodie Hoare, whose death everyone regrets, is 'experiencing the same difficulty in finding safe and profitable employment for their surplus funds.' No doubt the present Board do find this difficulty, but that does not say that suitable and safe employment for their money does not exist, and if two or three more up-to-date directors were added to the Board, or elected there in place of a similar number of older members who seem to be out of touch with modern requirements, the bank, whilst still being conducted on perfectly safe lines, would greatly increase its utility to the public and shareholders alike. As Mr. Morgan said, there are signs of improvement in the financial position of the Colonies. This is quite true, but with the increased popularity that other banking establishments are enjoying in the West Indies, and seem likely to add to, the directors of the Colonial Bank, unless they come out of their shell and cater for the general public, as they now do for the upper classes and larger firms throughout the West Indies, will find that this increased prosperity—which is not dependent on sugar, but on the general expansion of every other industry but sugar—will pass them by to go elsewhere. The West Indies must have an agricultural bank if they are to make the most of their resources. The articles you have already published on this important fact, although subject to criticism and amendment, are receiving a considerable amount of attention, and from the right quarters. Any day, therefore, further competition may be set up against the Colonial Bank in this way as well; but if this comes about, the support will not be forthcoming from London but from elsewhere in the Empire, for London is not the only centre of the world trading with the West Indies, any more than it can claim to be the centre that is doing its best to push on the interests of the Islands and through their prosperity to assure those of its own citizens and investors."

On reading the report we noticed that Mr. Morgan referred to the numerous rumours afloat as to the amalgamation of the Colonial Bank with the Royal Bank of Canada, some of which have gone so far as to say that negotiations have actually been concluded. "I have to say," he added, "that this report is untrue." There may be no truth in the report, but there is in the saying that "there is no smoke without fire," and if we have at times persisted in urging the Colonial Bank either directly, or by financing another bank, to meet the public demand for a thoroughly popular establishment, it has only been because we do not wish to see it superseded or absorbed by a more pushing rival. We do not believe in resting on our oars, or allowing the grass to grow under our feet, but we always respect and prefer old-established concerns, and for this reason alone—and there are others—we would prefer, and we hope to see the Colonial Bank remain *the* bank throughout the West Indies, and to expand and prosper off its own bat, as it can do if given a chance. Children who have been burnt fear the fire, and no one knows better than we do the fires of financial troubles (other people's troubles) that the directors of the Colonial Bank have passed through since the bank was incorporated in 1836, and emerged the better for their ordeals, but the future surely is rosy enough to bury the past, and to warrant our casting aside the mourning garments of fear and distrust in thinking only of the past, and putting on the brighter, but still safe garments of enterprise and energy for the present and the future.

* The *West India Committee Circular*, in view of the prospective opening of agricultural banks in British Guiana, gives results of the working of the Agricultural Bank in the Philippines. One of the good results already accomplished by the Philippine banks has been the discouragement of usurious loans. This is what the small agriculturists in Trinidad sadly need. At the same time, as we have already pointed out, the initiative must be started by the public in Trinidad, before they can expect others to come in and support them. Those connected with the Colonial Bank in Trinidad could, we consider, do a great deal unofficially to encourage the public to take up the matter and to start a bank along the right lines. If this was done the trade of the Island would greatly benefit, as the spending capacity of the agricultural community would be increased, and the leading banks in the Island would benefit accordingly, especially those whose officials were popular with and had gained the confidence of the depositors, and so assured the running of the agricultural bank on safe and progressive lines.

We see by the *Malay Mail* that the wedding took place on Saturday, August 19th, at Singapore, of Mr. James Henderson, of Messrs. Riley, Hargreaves and Co., and Miss Georgina Belle Rome Mackenzie, of Dublin. A reception was afterwards held at "Fairlie," the residence of Mr. Millar.

Soya Bean Cultivation in Portuguese Africa.

The Mozambique Department of Agriculture has issued as its Bulletin No. 5 some particulars of the soya bean, its varieties, analysis, food contents (for human consumption, fodder, or manure), method of cultivation, &c., that should prove of considerable value just now when the cultivation of this crop is spreading on all sides. The pamphlet is by Mr. E. H. Heron, who shows considerable knowledge of the subject on which he writes. Of 200 or more varieties the yellow one, which is recommended for Portuguese East Africa, is reported as having 17 to 19 per cent. of oil. The black 16.80 per cent., the green 17 per cent., the white 16.60 per cent. These percentages cannot be relied on in all producing centres, but will, apparently, increase or diminish according to how they like or dislike their surroundings. As regards yield, 100 pods have been obtained from one plant, but a good average in a field is said to be 40. The height of the plants and the time they take to come to maturity varies. The yellow under average conditions will grow, according to the character of the soil, from 3 to 5 ft., and requires 120 to 150 days to mature. The seed of this kind, Mr. Heron tells us, must under no circumstances be planted more than 2 in. deep. The greenish-yellow grows from 3 to 4 ft. high, the black 4 to 6 ft. The brown kind grows so tall that it is inclined to fall. It (the brown) matures in 110 days. The green matures in 90 days, runs up about 3 ft. high, and produces kidney-shaped seeds, green throughout, and much larger in size than any of the other varieties.

It is generally desirable in harvesting a crop for seed to do so before the pods are entirely mature. If they become too ripe they are liable to burst open in drying and transportation to the machine, and so cause a large part of the seed to be lost. As to yield, 20 bushels of seed can generally be obtained on a comparatively poor soil, and 25 to 40 bushels, under ordinary conditions are returned as being average yields; 25 bushels are calculated as weighing 512 lb., and 40 bushels as 840 lb.

An average analysis of the seed of the six chief varieties gave the following results:—

Fresh or air-dried seed	Water	7·70
	Protein	35·40
	Fat	20.35
	Nitrogen free extract	26·15
	Fibre	4·60
	Ash	5·79

For green fodder, or as green manure, about 7 to 12 tons can be calculated per acre, according to the soil.

The soya bean is especially adapted to the maize and cotton belts. Generally speaking, it requires about the same temperature as maize, and while it develops best on fairly fertile loams and clays, it makes a good growth on poorer soil than maize will, provided that inoculation is present. The yellow kind succeeds well on sandy soils. While the bean is possessed of excellent drought-resisting qualities, at the same time it seems to be able to survive a period of excess of moisture better than cow-peas or even maize. Too rich a soil develops the plant at the expense of the seed. On this account we should imagine that for seed production a poorer soil was preferable, as then the yield of seed is relatively larger. The ground can be irrigated if necessary.

In discussing the inoculation of the soya bean, Mr. Heron tells us: "Like other legumes, the soya bean is able to utilize the nitrogen of the air and add it to the soil by means of root nodules." These nodules, it will be remembered, are caused by certain bacteria, and unless they are present soya bean plants in the usual types of soil will make a weak growth and many will turn yellow and die. In isolated localities where the crop has not been grown some difficulty may be expected from lack of inoculation during the first season. Inoculation of a new field may be secured either by the soil transfer method, or by the use of pure cultures. The soil transfer method consists in scattering soil from an old, well-inoculated soya bean field over the new ground at the rate of 200 to 300 lb. per acre. To ensure even scattering this should be thoroughly mixed with several times its weight of ordinary soil. The scattering should be done on a cloudy, or even a wet day, or late in the evening, and harrowed in immediately, as bright sunshine is very harmful to the germs. When the first crop is a failure in isolated places where neither pure culture nor inoculated soil can be obtained, a small crop must be grown successively two or even three times on the same plot till a good growth is apparent, showing that the soil has become inoculated; such soil can then be used to inoculate large areas.

Rubber-planting Prospects in Angola.

By our Special Correspondent.

There are many divided opinions about the climate and soil required for the culture of Manihot rubber. Some planters have given it up in disgust, others consider it the most lucrative of all the rubbers, as the trees can be tapped in the third year and they can be planted cheaply. Both may be right, according to the favourable or unfavourable conditions for rubber-planting with which they are surrounded. There are men in Portuguese East Africa who have planted Ceará (*M. Glaziovii*) on rich, alluvial soil in a humid climate, and the growth of these trees has been enormous, but as they yielded little or no latex they were abandoned or cut out as useless, to make room for more lucrative crops. Others in Portuguese East Africa have studied the question more closely, and have laid out their plantations on land fairly high up and away from the coast, where the rainfall is not too heavy, and the soil not too rich or even of a rather poor, gravelly nature. In the latter case the planters will probably be successful, as the first tappings have given great encouragement. Naturally the two great questions to be considered are—suitable soil and suitable climate; given these two conditions, the cultivation of Manihot rubber, especially Ceará, should be a very lucrative investment. The Kibwezi Co. are doing well with irrigated trees.

There are places in Angola, Portuguese West Africa, where the cultivation of Ceará should be a great

success. In one place the country has an elevation of about 3,000 ft., it is a little over 100 miles from the coast, and a newly-constructed railway runs right through it. Here the soil for hundreds of miles is made up of decomposed granite, and contains a fair amount of humus, the subsoil being of a more or less gravelly nature, whilst the rainfall is light but regular.

A few trees of *M. Glaziovii* have been grown experimentally, and though only 2½ years old, as much as 1½ oz. per tree have been obtained at one tapping. The trees show good but not excessive growth.

Discussing the matter with a qualified and experienced agriculturist, he told me that under such favourable conditions, the cultivation of Ceará rubber should be a great success, and there are large tracts of this level and undulating country that could be transformed into profitable rubber plantations. Besides rubber, cotton seems to have a great future in this high granite country in Angola, and already small patches of caravonica and long-staple cottons have been grown with distinct success, in many cases 200 bolls having been obtained from one plant, and 60 acres averaged 900 lb. of seed cotton. The climate is not unhealthy, provided ordinary care and attention is taken. Labour is plentiful, and costs about 10s. per month, and though the natives are extremely raw, they can be taught to work properly without being affected with undue civilization, provided those in charge know how to manage them, and do not cause them to deteriorate.

Minor Industries of Hawaii.

By Frank Evans.

Of the Department of Agriculture, Trinidad.

Sugar-cane culture so overshadows everything else in the Hawaiian Islands that the stranger is apt to overlook other and, for the time being, less financially important cultivations.

Since the annexation, the U.S.A. Experiment Station, now under the able administration of Dr. E. V. Wilcox, has done yeoman service for the territory in initiating and developing agricultural interests other than sugar, with the result that to-day business men of capital and energy are turning their attention to the raising of such crops as cotton, rice, sisal, pine-apples, rubber, coffee, and tobacco.

The valuable work of the Experiment Station Horticulturist (Mr. J. E. Higgins) will, in the course of a few years, practically revolutionize the Islands' fruit trade.

The best-known varieties of mangoes, citrus, avocado pear, and other tropical and sub-tropical fruits are being imported in quantity and rapidly propagated and distributed. While San Francisco offers a permanent market for almost every kind of fruit that can be grown in the Islands, it may be well to remember that the opening of the Panama Canal will bring increased shipping to the harbours of Hilo and Honolulu, thus creating a new steady local market for all kinds of fresh fruit and vegetables, as well as farm and dairy produce. Mr. Higgins's special and most recent work is the improvement of the papaw—*Carica papaya*—and several new varieties of outstanding merit have been raised. It is claimed by some that the papaw or papaia is too thin-skinned and delicate a fruit to stand the six days' journey to the San Francisco market; that this is an error, the writer had an opportunity of observing on a recent voyage to Japan, when a large quantity of this fruit was shipped at Honolulu, May 14th, and remained sound and of good flavour. The fruit was daily served at table up to May 26th.

The pine-apple industry now ranks next in importance to sugar and has made rapid progress within the past few years. Thousands of acres are under cultivation, chiefly on the islands of Oahu and Kauai. This industry now having been demonstrated a financial success may be considered well out of the experimental stage. The greater part of the crop is canned for export. In the 1910 campaign the Hawaiian Packing Co. alone canned over 75,000 fruit.

To Mr. F. G. Krauss, late of Experiment Station, and now on the staff of the College of Hawaii, belongs the credit of stimulating interest in cotton and rice, and under his guidance both industries are now full of life, vigour and promise. Caravonica cotton thrives remarkably well in the highlands where there is a rapidly extending area under cultivation. The plant is treated as a perennial and exceptionally heavy yields have been obtained from second and third year old trees.

Rubber has received a good deal of attention, several local companies are in operation. It is expected that some 20,000 trees will next year attain tappable size.

Coffee is quite an old-established industry and grows remarkably well in several districts in Hawaii. With a little protection it would be a highly profitable cultivation. One of the healthiest coffee plantations I have seen anywhere in the world is that of Messrs. Lewison Bros., of Hawaii. The export of sisal slowly but steadily increases year by year. As there are only two companies operating, this cultivation offers a good opportunity for outside capital and further development. Mr. W. Weinrich, pioneer of the industry in Hawaii, and probably the best-posted fibre man in the Tropics, is a firm believer in a "square deal" for the plants. His work for the Hawaiian Fibre Co. has clearly demonstrated that sisal, like all other plants, responds to good soil and high cultivation.

We have mentioned once or twice lately, reports Messrs. Zorn and Leigh-Hunt, that Nitrate shares appear to be coming into favour again, both for investment and speculative business. The market has been a good one this week (ending Oct. 7), and the shares of most of the better known concerns have improved. For this movement there are several reasons, amongst the chief of which may be stated the steady increase in the demand for nitrate, the quiet rise in the price of the produce, the fact that the non-renewal of the Nitrate combination has not led to the wholesale competition at one time feared, and the direction of the speculative investor to foreign fields where good returns on the money, either present or prospective, can be obtained by the taking up of a certain amount of risk.

The Question of Smoke-coagulators.

Mr. Petch, in his recent book on "The Physiology and Diseases of *Hevea brasiliensis*," tells us that the use of hydrofluoric acids allows the rubber to retain from 9 to 10 per cent. of water, and that the rubber has consequently a greater degree of elasticity. This remark confirms what we have always contended for "fine hard," viz., that leaving a certain portion of the water in the rubber is beneficial to the rubber as well as a direct gain to the shipper. Prices paid during the last ten years for "fine hard" in comparison to its *net* caoutchouc content against "plantation," sheet, or blanket, would give, as Mr. W. H. Johnson showed in our May (1910) issue, a larger profit. With the tendency, therefore, to smoke-coagulate rubber in bulk, planters will be advised to bear this in mind. "The method of preparation now in vogue in the East," Mr. Petch points out on p. 56, viz., "by the addition of acetic acid, was based on Biffen's announcement that the smoke of burning palm-nuts used to coagulate Pará rubber contained acetic acid. That the burning nuts should give off acetic acid was only to be expected, since the destructive distillation of wood is one method of manufacturing it. If there is no other active substance in the smoke except acetic acid and creosote, then it would be waste of time and money to establish plantations of those palms, as is often suggested, in order to use the nuts for smoking rubber, for any other wood smoke would serve the purpose equally as well. All that is required is that the burning material should give off a dense smoke." Mr. Petch remarks that the smoking machines which have been put on the market are of too limited a capacity; the makers of these machines, however, contend that these remarks were probably written last year, and that during the past few months, especially since they have had the advantage of personal consultation with the planters at this year's Exhibition, the present type of smoke-coagulators are certainly of a capacity to deal with the latex of even the largest estates. This is an important fact, as with the small machines that were first introduced the number required made the cost rather heavy.

Pigeon Peas as Cover Crops.

By O. W. Barrett, Acting-Assistant Director of Agriculture, Philippine Isles.

In the new and indispensable tropical planters' *vade-mecum*, "Notes on Soil and Plant Sanitation on Cacao and Rubber Estates," by H. Hamel Smith, I find this statement :"Stockdale warns us to use it (Pigeon peas, *Cajanus indicus*) with caution. Cover crops are, among other benefits, planted to keep the ground moist, but Mr. Stockdale points out that pigeon peas dry up the land to a considerable extent, and therefore should not be used in any dry district, except as a rotation crop at the proper season of the year."

Up to October, 1910, I was of the same opinion as Mr. Stockdale, but at that time I was obliged to change my opinion. It came about in this way: While inspecting one of the experiment stations of the Bureau of Agriculture (of the Government of the Philippines) at Lamao, just across the bay from Manila, I was examining the root of the various legume crops in the experimental plots, for bacteria nodules. The soil was very dry on account of a long period of drought—so dry, in fact, that the Superintendent had some time previously stopped all planting operations. In the plot of pigeon pea, which was planted rather closely, so that the dense heads of the individual plants formed a thick layer of foliage at about 3 ft. above the ground, I was surprised to find the soil was so moist that it *would actually stick to the shoes;* at first I supposed that an underground water supply was responsible for this startling phenomenon, but further investigation proved that the moistness of the earth was due entirely to the pigeon peas, *i.e.*, the foliage canopy had prevented practically all surface evaporation, and although there must have been considerable water removed from the soil through respiration processes of the leaves, the latter was a negligible quantity; and this removes from my mind the doubt which is usually felt, I believe, by agronomists in recommending cover crops for dry soil; the amount of water transpired and lost through the leaves is of no account as compared with the very obvious benefit to the soil by the prevention of direct and excessive evaporation from the ground surface. And, so far as I can see, this principle applies even better to low-growing cover crops than to second-class, bushy ones like the pigeon pea. With due apologies to Mr. Stockdale, I must say that I have "learned better."

The Improvement of Stock.

In our May issue we referred to the benefits that accrue to forage crops by the use of phosphatic manures and basic slag, and the benefits obtained in an improved quality of meat by a judicious use of suitable manures. To illustrate this we called attention to Professor Somerville's report on the matter, As far back as September 1909, we pointed out the marked improvement shown by using mineral and nitrogenous manures when raising alfalfa, hay, and root crops for stock feeding, the experiments at the time attracting general notice both on this side as well as from stock raisers in the Argentine, Paraguay, Jamaica, Australia, &c., &c. Since then by our exchanges we are glad to see that much more attention is now being devoted to improving the soil with the object of increasing the weight of stock fed off the land, and especially to improve the quality of the beef. The latter is especially important if the animals are needed for making beef extract.

It is on account of the richness of the soil of the Pampas in Argentina and Paraguay, and through that the nourishment contained in the forage crops raised, that the meat we receive from there is of such fine quality. Of course a large number of prize bulls were introduced at the start, and the leading stock-breeders have continued to import the best animals bred in Europe, especially in England and America, so as to increase and maintain the size and weight of their animals. Their object, however, would meet with no success were the land not capable of raising the feed necessary for the animals, and the ranchers realizing this are taking care, when necessary, to augment the

natural manure deposited by the animals on their stud farms by imported fertilizers.

When the Liebig Company extended their hospitality to certain journalists to visit their ranches, we regretted that we were unable to form one of their party, as it would have greatly assisted us in our work if we could have studied their up-to-date methods, and especially been able to inspect and examine their cattle, of which everyone speaks well. The climate is of course greatly in favour of cattle-raising, as it renders the cattle less liable to tuberculosis and other diseases, and when one has between a quarter and half a million animals, including, as the Leibig Company can boast, nearly 1,000 pedigree Hereford bulls, it is a great thing to be able to register ·017 per cent. of diseased animals (under 1 in 5,000), instead of 4 per cent. if not more. How far this low percentage of disease is due to favourable climatic conditions, veterinary skill, and the perfection of cleanliness and care all along the line we cannot say; but we do maintain that if the fertility of the soil is not maintained and nourishing fodder obtained, all the care and attention and money expended would be lost. On this account every care and attention is given to the upkeep of the stud and home farms, whilst the outside pastures, which are said to cover some 5,000,000 acres, equal to about one animal to every 12 or 14 acres, are left to recuperate naturally.

In the copies received monthly of the *Bulletin of the International Institute of Agriculture* at Rome, there are no notices that we study more carefully than those referring to the replenishment of the exhausted pasturages for the raising of stock. In view of the serious rise in the price of meat, due to the demand outstripping the supply and the increased rates of pay that the labouring classes (vegetarians and meat-eaters alike) are clamouring for on all sides, it is important that no effort or cost be spared to make those farms that are engaged in cattle raising maintain the fertility of their soil, and thus improve the quality first of the forage crops raised, and through that the weight of the beasts and the quality of their beef.

The German Potash Syndicate, of Dessauerstr, 28-29, Berlin, and 117, Victoria Street, London, S.W., are issuing a series of books on the Economic Plants of the West Indies, whose utility will also be appreciated by those living far away from those islands. Published under the direction of our friend Prof. Hendricksen, and emanating from the Syndicate's office at Havana (P.O. Box 1,007), Cuba, copies can also be obtained from their Berlin, London, or other distributing centres. Of the series their publication on the planting of cacao will be found extremely up-to-date and useful, and those who have been asking for the latest information on bananas, tobacco, and other crops, should note that they can obtain, we believe, free of all cost to themselves, similar publications in English on citrous fruit, coffee, cotton, pineapples, and, of course, as stated, cacao, tobacco, sugar-cane, bananas, &c. Those on sugar-cane, coffee, pineapple, tobacco, cacaos, and oranges can be had in Spanish, whilst in French they have general manuring (also published in English and Spanish), coffee, tobacco, and bananas.

Sugar.

Since the end of September, reported Mr. C. Czarnikow on October 5th, the weather turned rather cold, not favouring the growth of the roots, whilst the rain has deteriorated the quality appreciably. In some districts in which the crop was nearly ripe the polarization decreased from 18 or 19 degrees to 16 and 15 degrees. In warm sunny weather the roots might have picked up again, but during the last eight days there has not been such a chance, and it seems rather late in the season to hope for much improvement. The official Prussian agricultural report, embracing 80 per cent. of the total German area, estimates roots at only 14.92 against 29.88 tons per hectare, and even though the remaining 20 per cent. have probably more than half a crop, it seems that 1½ million tons sugar would be a maximum for Germany. Simultaneously there were cables here from Cuba that that crop continues to suffer from drought, and that sanguine estimates must be reduced. On the other hand, there are nearly 100,000 tons Javas shipped in September, with more to follow in October, as well as a large quantity of Javas re-shipped from India to Europe. Various of these steamers go to America, and others bring white sugars to cover a very heavy Continental deficiency in Refined, but our refiners will not require as much beet as last year. Traders hesitate to give estimates; there is more uncertainty this year than ever before, and opinions sometimes differ by half a million tons. For Russia alone the estimates vary between 1,800,000 and 2,200,000 tons. The Government puts the weight of roots at 13 against 11 million tons, but according to fabricants last year's roots weighed 13 millions, therefore the chances are for over two million tons sugar. Some people, again, believe that the Russian application in Brussels for a larger contingent will be dropped from lack of sugar, whilst others think Russia cannot otherwise help herself in face of her enormous crop. We shall have to wait for factories' report in a fortnight, and meantime trust that our higher range of prices will protect us against undue excitement. May moved from 16s. 6d. to 16s. 4½d. to 17s. 8¼d.

France is doing less in ready sugars, but bought distant cane, showing that she, too, is afraid of short supplies. America, on the other hand, is doing nothing, does not even quote prices, but on basis of arrival prices seems to have contracted large quantities of Louisiana sugars, as mentioned last week.

The American market has been quiet, and buyers have kept out of the market. The spot quotation has receded to $5.80 cents for 96 per cent. Centrifugals= 19s. c.i.f. for 96 per cent. Javas=17s. 9d. f.o.b. Hamburg for 88 per cent. nett beet.

As regards Cane-producing countries, we hear that rain is still wanted in Cuba. In Formosa the serious damage by hurricanes previously reported is confirmed.

British West India.—Crystallized Demerara, good yellow 21s. 6d. duty paid, fine ditto and pale 22s. 3d. to 22s. 6d. Crystallized Trinidad, low brownish yellow 20s. duty paid, low middling yellow 20s. 3d. to 20s. 6d. In Liverpool 900 bags Peruvian Syrups, soon due, sold at 13s. 9d. floating, landing, telquel.

Cotton.

THE following were the prices for Cotton in London on October 6th, according to Messrs. Slann and Davies :—

	Good Fair.	Good.	Fine.	Superfine.	Compare Good 1910.	Compare Good 1909.	
	d. d.	d. d.	d. d.	d.	d. d.	d. d.	
Surat kinds* ...	$5\frac{1}{16}$ to $5\frac{7}{32}$	$5\frac{5}{16}$ to $5\frac{7}{16}$	$5\frac{3}{4}$ to $5\frac{9}{16}$	—	$6\frac{5}{8}$ to $6\frac{15}{16}$	$5\frac{5}{8}$ to $6\frac{5}{16}$	per lb.
Madras	$5\frac{7}{16}$ to $5\frac{9}{16}$	$5\frac{11}{16}$	—	—	$6\frac{5}{16}$ to $7\frac{1}{8}$	$5\frac{5}{8}$ to $6\frac{5}{16}$	—
Bengal	—	$4\frac{7}{8}$	$5\frac{1}{8}$	$5\frac{1}{4}$	$5\frac{11}{16}$	$5\frac{1}{8}$	—
Assam	—	$5\frac{1}{8}$	$5\frac{1}{2}$	$6\frac{1}{4}$	6	$5\frac{3}{8}$	—
China	—	$5\frac{5}{8}$	$5\frac{7}{8}$	$6\frac{1}{8}$	$5\frac{3}{4}$	$5\frac{7}{8}$	—
West Indian ...	$7\frac{1}{4}$	$7\frac{3}{4}$	$8\frac{1}{4}$	$8\frac{1}{2}$	$8\frac{3}{4}$	$6\frac{1}{2}$	—
Sea Island ...	12	14	$16\frac{1}{2}$	19	18	$10\frac{1}{2}$	—
West African ...	$5\frac{1}{4}$	$5\frac{3}{4}$	6	—	$7\frac{9}{16}$	—	—
East ,, ...	6	$6\frac{3}{4}$	$8\frac{3}{8}$	—	$8\frac{1}{2}$	—	—

* Liverpool quotations.

The market was depressed in the early part of the week (ending October 7th), and prices at one time marked a decline of about 30 points, but closing rates show a slight recovery. The quotation for "Middling" has been reduced from 6·11d. to 5·73d., although the Spot demand has been good every day. The movement continues large, with weather reports excellent. East Indian is so irregular that it is scarcely possible to give exact quotations.

The import into Liverpool this week amounts to 48,265 bales, since September 1st 221,527, same week last year 62,225, last year's total 250,500 bales. The estimated Sales amount to 64,000 bales, including "called." Middling American is quoted at 5·73d. per lb., last year 7·70d., 1909, 7·15d.

Movement of American Cotton since September 1st :—

	1911-12.	1910-11.	1909-10.
Brought into sight	1,494,000	1,078,000	1,283,000
Exports from United States since September 1st—			
To Great Britain	364,000	290,000	202,000
To Continent, &c.	394,000	325,000	507,000
Total crop	—	12,120,000	10,610,000

The latest quotations of Americans for delivery, basis Middling, any port, G.O.C. :—

	October 6th.	Last Week.	Last Year.
	d.	d.	d.
October	$5{\cdot}41\frac{1}{2}$	5·62	7·57
Oct.—Nov.	5·39	5·57	$7{\cdot}48\frac{1}{2}$
Nov.—Dec.	$5{\cdot}36\frac{1}{2}$	$5{\cdot}53\frac{1}{2}$	7·45

Coffee.

By Messrs. C. M. AND C. WOODHOUSE.

THERE was but little change to report in the coffee market during the week ending October 7th; the tone remained firm and the small supplies of Central American descriptions offered met with a ready demand at fully late rates. Dumont Santos was rather irregular, but on the whole values were full up. According to Messrs. Düüring and Zoon the stocks in the principal ports of Europe on October 1st show a decrease for the month of 329,000 bags against a decrease of 183,000 bags at the same time last year; the visible supplies, on the other hand, show an increase for the month of 932,000 bags against an increase of 365,000 bags in 1910. The market for "futures" opened firm on unfavourable reports of the prospects of the new crop, and after some irregular movements closes again much dearer on reports of damage by hailstorms. We quote :—

		To-day.	Sept. 28th, 1911.
London ..	Santos, Mar. delivery	59s. 3d.	56s. $4\frac{1}{2}$d.
New York ..	No. 7 Rio ,, ,,	12.50 cents.	11.70 cents.
Hamburg ..	Santos ,, ,,	65 pf.	$60\frac{3}{4}$ pf.
Havre ..	Santos ,, ,,	$78\frac{3}{4}$ francs	74 francs.

The receipts at Rio and Santos from July 1st to October 4th, 1911, were 5,431,000 bags, against 5,476,000 bags in 1910, and 7,522,000 bags in 1909 respectively.

Sales include the following, viz. :—

Java.—58 bags, at 76s. for bold greyish.

Jamaica.—58 barrels, at 69s. 6d. for smalls, 73s. 6d. to 93s. for fine fine ordinary to good middling, 109s. for good bold.

Costa Rica.—30 bags, at 68s. for smalls, 74s. 6d. for low middling, 81s. 6d. for bold.

Guatemala.—550 bags, at 76s. 6d. for good middling, 79s. to 80s. for bold.

Nicaragua.—27 bags, at 70s. 6d. for smalls, 72s. for fine fine ordinary, 76s. 6d. for bold.

Mexican.—82 bags, at 77s. for good middling.

Colombian, &c.—1,345 bags at 68s. to 74s. 6d. for smalls, 74s. to 77s. for low middling to good middling, 76s. to 80s. for bold.

Dumont Santos.—2,384 bags. Washed at 69s. 6d. to 70s. 6d. for smalls, 71s. to 73s. 6d. for medium, 73s. to 75s. for bold. Unwashed at 68s. 6d. to 69s. 6d. for smalls, 70s. to 70s. 6d. for medium, 72s. to 73s. for bold.

UNDER date of August 30th the Avreboo Rubber Estates, Ltd., write as follows :—"Referring to your post-card reminding us that our subscription to TROPICAL LIFE expires with this month's issue, we will forward cheque for the current year, together with the subscription for an additional copy. The additional copy which we now propose to take will be sent out to the manager on our estates, and we wish to commence with the copy just received (August). We found the present number an extremely interesting one; hence the order for an additional copy."

The India-rubber Market.

The London rubber sales tend to exceed most of the others in the time they take, although efforts are being made by the brokers to speed-up the bidders, and so get over the auctions as speedily as possible. Rubber, however, is not tea, and there is a limit to hustling; we feel, therefore, that the time cannot be far off when the rubber sales will take place weekly, instead of fortnightly as now; and surely if the cocoa sales which as a rule only take an hour and a half, or at the most two hours, are down for every week, the rubber auctions which cover two or three days should be split up, and also held weekly.

Meanwhile our friends Messrs. S. Figgis and Sons report that at the auctions held from October 3rd to 5th 460 tons of Eastern Plantation alone were offered, so the wonder was that the sales were so quickly got through without sacrificing the rubber, but as practically all the plantation was sold, no harm, and probably some good, was achieved by the more rapid bidding.

Messrs. Figgis report that the sales during the first week in October met with a slow demand and prices opened 6d. to 9d. below the previous auctions, but somewhat recovered at the close.

The announcement on October 2nd of a heavy reduction in the makers' prices of tyres probably accounts for much of the decline; but "war" and political unrest has also contributed to it.

At the sales fine hard Pará, which was down to 4s. 5½d., recovered on October 5th to 4s. 7d. Plantation Malay realized—sheets, fair to fine smoked, 4s. 9¼d. to 5s. 1½d.; mouldy and part smoked, 4s. 6¾d. to 4s. 9d.; fair to fine unsmoked, 4s. 9d. to 4s. 11¾d.; damp, mouldy, pressed, &c., 4s. 3d. to 4s. 8d. Block, fine pale Lanadron, 4s. 9½d. to 4s. 11d.; clean dark Lanadron, 4s. 7½d. Crêpe, fair to fine pale, dull to good palish, 4s. 9d. to 4s. 11¾d.; light brown and grey, part streaky, 4s. 8½d. to 4s. 11¼d. (one lot 5s. 1½d.); clean brown, 4s. 5d. to 4s. 10¼d.; dark brown, part specky, 4s. 1¼d. to 4s. 8¼d.; black soft and pressed, 3s. 6d. to 4s. 5d.; smoked, 4s. 5¼d. to 4s. 10¾d. Scrap and virgin, fair to fine, 3s. 9½d. to 4s. 5¼d.; mixed and inferior, 1s. 9d. to 3s. 3d. Rambong, scrap, 3s. 9¼d. to 4s. 1d. Castilloa, block and sheet, 3s. 5d. to 4s. 3¼d.; soft, 2s. 0¼d. to 3s. 1d.

Ceylon.—Sheets, fair smoked, 4s. 9½d.; sheets and biscuits, fair to fine unsmoked, 4s. 9¼d. to 4s. 10½d.; damp, mouldy and stuck, 4s. 5d. to 4s. 9d.; Ceara, 4s. 3¾d. to 4s. 7½d. Crêpe, thick, fair to fine, 4s. 10¼d. to 5s. 0½d.; fair to fine pale, dull to good palish, 4s. 8¾d. to 4s. 11½d.; clean and light brown, 4s. 6d. to 4s. 10½d.; dark brown, 4s. 3d. to 4s. 8d.; black, soft and pressed, 3s. 5d. to 4s. 4d.; smoked, 4s. 8d. to 4s. 10d. Scrap and cuttings, fair to fine, 3s. 9½d. to 4s. 2½d.; mixed and inferior, 2s. 8d. to 3s. 2d.

Of wild rubbers Mollendo, unselected fine in bales sold at 4s.

Zanzibar, Mozambique, &c.—Manihot brown crêpe, 3s. 11½d.; reddish ball, part barky, 3s. 5¾d.; good red ball, 3s. 11d.

Madagascar.—Soft dark slab, 2s. 3d.; fairish pinky, 3s. 2d.

Tonkin.—Soft porous ropes, 2s. 11¼d.

Congo.—Small dark marbles, 3s. 6¾d.

Other reports speak of 3s. 6½d. lb. being paid for very rough British Guiana biscuit, and 3s. for pressed whitish slab. Caucho ball was easier with sales at 3s. 11½d. for spot. Fine Bolivian 4s. 6½d. Fine Peruvian, 4s. 4½d. Fine Mollendo, 4s. 2d. lb.

Pará rubber statistics for the month of September (tons):—

	Pará.	Caucho.	1911.		1910.	1909.	1908.
Receipts at Pará ..	2,430	210	= 2,640	agst	1,980	2,020	2,350
Shipments to Europe	870	160	= 1,030	,,	880	1,080	1,130
,, America	1,490	50	= 1,540	,,	1,030	1,200	1,090

Crop statistics, June 30th, 1911, to September 30th, 1911 (two months):—

	Pará.	Caucho.	1911.	1910.	1909.	1908.	1907.
Pará Receipts 1911	4,880	770	5,650	6,180	5,290	5,560	5,280
Pará Receipts 1910	4,790	1,390					
,, Shipts., Europe	2,530	830	3,360	3,060	2,890	2,800	3,110
,, ,,America	3,100	370	3,470	2,750	2,140	2,730	1,800

Pressure on our space this month has caused us most regretfully to leave out the Rubber Share Market Report.

Rubber Planting in Grenada, W.I.

In our August issue we called attention to the interest that the West Indian island of Grenada was beginning to take in rubber planting. From the minutes of the Agricultural Society out there, we now learn that the Superintendent of Agriculture seems to think that in the next few years there will be a considerable amount of capital invested in the rubber industry in the island. In April last an order was forwarded by the Agricultural Department to the Royal Botanic Gardens, Ceylon, for 75,000 seeds of *Hevea Brasiliensis*, this representing a future area of 300 or 400 acres. There are besides several thousand plants of this variety of rubber already scattered on different estates there, while a fairly extensive cultivation of Castilloa has reached maturity at Annandale Estate. Altogether, by the end of this year the total capital invested in rubber can hardly fall short of £1,200, a sum which is small in comparison with cacao interests, but which may be merely the first instalment of large investments in the future. Meanwhile there are many questions of importance to be discussed, such, for instance, as the suitability of Grenada soil for Hevea, and secondly, the best method of planting the trees, but both of these, together with the question of the marketing of the rubber, are being carefully arranged for. It will be some little time yet before the island can export rubber on a commercial scale; but time, with busy men, soon passes, and we shall soon be looking forward to Grenada rubber enjoying as good a reputation for preparation and quality down Mincing Lane as Grenada cacao can already claim.

Tea.

By Messrs. Wm., Jas. and Hy. Thompson.

Crop Prospects.

Crop prospects are now attracting general attention, and the latest details are of interest. The out-turn from Northern India to the end of August was generally estimated to show an increase of about

12,000,000 lb.; since then, however, telegraphic advices tend to indicate that some of this increase has been lost during September. Latest mail reports from Calcutta advise that exports to outside markets are about level with last year, and it is probable they will absorb as much as, or perhaps slightly more, between now and the close; at the moment, therefore, it would appear that London will receive the bulk of the increase, which, however, may yet be reduced, and it is noteworthy that practically none of the anticipated excess has yet been handled on this market. Against this, however, is indicated a probable shortage from Southern India which will in some slight measure modify the increased crop expected from Northern India, and present conditions, as well as the statistical position, do not create an impression that the prospective supply will be more than the Trade will require. Advices from the producing districts tend to point to moderate supplies of low-priced tea, and to this may be attributable the recent noticeable increase in China import figures.

This week's (ending October 7th) auctions have again been heavy. In Indians the total quantity brought forward is much about the same as last year to even date. Quality as a whole has shown a falling-off; less tip has been shown generally; the proportion of finest tea has been limited. In Ceylons quality has continued to show some improvement, and the sales have included a fair percentage of good flavoured teas of high growth. The active tone reported in our last has been accentuated, and the strength of the demand has been centred on all tea up to about 9d. per lb., for which frequent advances have been recorded. Common tea generally is fractionally dearer, and the quantity available at 7¾d. per lb. has become restricted; the quotation for clean leaf tea of this class is now about 7⅞d. per lb.

The average of all Indian tea sold to date is about 1d. per lb. better than last year; common kinds have benefited by the higher market to a much greater extent than medium to good qualities, and although both descriptions have advanced, the difference between their relative values has narrowed down to about 1¾d. per lb., whereas last year it was about 2½d. per lb. at the corresponding date. This feature is shown in a comparison of the following district averages realised:—

Assam ...	...	1911—10d.	...	1910—9½d. per lb.
Cachar and Sylhet	,,	8¼d.	...	,, 7d. ,,

A summary of the official report from the producing districts for the month of September advises that outturns generally have been normal to good, immediate prospects are reported to be fair throughout, with the exception of Darjeeling and the Terai, where blights are affecting yield; portions of the Dooars are also similarly affected.

With Indian Teas offered for sale, a noticeable falling-off in quality and general character is visible in Assam growths; and Darjeeling teas are also more or less inferior to recent invoices. Other districts call for no special comment, quality being about average for the time of year, although in occasional parcels "stalk" is rather more in evidence than usual so early in the season. Notwithstanding the large offerings, the sales passed off with spirit and brisk competition from all quarters, buying being well distributed; prices throughout may be quoted firm to occasionally dearer on the week. Common tea is a point higher under a strong demand. The best averages from the various districts were: Darjeeling—Ting Ling, 2s. 4¾d.; Margaret's Hope, 2s. 3d.; Nagri 1s. 7¾d.; Mineral Spring, 1s. 7d.; Rungmook, 1s. 3d.; Jungpana, 1s. 2¼d. Assam—Rupai, 1s. 6¼d.; Tara, 1s. 2¼d.; Pabbojan, 1s. 2d. Dooars—Newlands, 9½d. For the whole sale on Garden Account the result was 9⅜d. per lb., compared with 8½d. per lb. a year ago.

The Ceylon sale on Tuesday was of moderate size. Demand was good for all grades; bidding was brisk, and came from all sections of the Trade. Tea for price was fully firm, and leaf teas about 8d. to 8¼d. were a strong market. Low to medium Broken Pekoes were well supported, and frequently showed advances on last prices. Good Pekoes and Orange Pekoes were wanted by the shippers, and sold well. Good to fine Brokens, though irregular, on the whole made full prices. Dusts and Fannings were steady to firm. The highest averages were: Mount Vernon and Cranley, 1s.; Kelliebedde and Pita Ratmalie, 11½d.; Roehampton and Sutton, 11¼d.; Kenmare, Brookside and Regalla, 11d.; Mahacudugalla, St. Leonards, and El Teb, 10¾d.; Udaveria, Kehelwatte, and Glendevon, 10½d. Since January 1st, 907,635 pkgs. have been advertised compared with 1,003,237 pkgs. during the same period, 1910. For the whole sale on Estate Account the average price realised was fully 9d. per lb., against 8¼d. per lb. a year ago.

With China teas the demand has been more in evidence for common Monings, which have been freely dealt in at prices ranging from about 5½d. to 6d. per lb., some of which, ex recent arrivals, show attractive quality. Other descriptions are a steady but quiet market.

There was a strong inquiry for all grades of Javas to which values have responded, flavoury Brokens in some cases marking advances of ¼d. per lb. on last prices. For the whole sale on Garden Account the result was 8⅝d. per lb.; last year 7⅛d. per lb.

London deliveries for nine months ending September 30th, 1910-11:—

		1911.		1910.	
Indian, Black ...	...	127,014,200	...	123,545,400	lb.
,, Green ...	...	25,000	...	11,800	,,
Ceylon, Black ...	...	79,168,800	...	82,302,400	,,
,, Green ...	...	467,300	...	195,700	,,
China	...	18,292,500	...	14,279,600	,,
Java	...	11,135,600	...	10,656,400	,,
		236,103,400		230,991,300	,,

The London Cocoa Market.

By the Editor.

In "aside" conversations one hears a good deal about valorization of cocoa; although, generally speaking, no one can say such a thing exists; neither does it, so far as I know, but it may do so in practice as well as in theory, and these chance conversations are mainly confined to finding out the latest news on the subject, and how much more your neighbour has

heard about the matter than yourself. I notice, however, that fairly long notices on the matter have appeared in the columns of the West Indian Press, the *Port of Spain Gazette*, Trinidad, in particular (I believe it was) having something of importance to say about it. If the importers and makers on this side are keenly striving to find out the truth, needless to say the producers and shippers over the water are still more anxious to know what is being done, whether the reports have any truth in them, and if so, what chance there is of the valorization of cocoa becoming *un fait accompli*.

The heavy rise in the price of coffee is causing several champions of the Coffee Valorization Scheme of 1908 to claim that present satisfactory prices, and the really good rates that have all along been maintained since the bumper crop (19,000,000 bags) of 1906-7, have been entirely due to skilful handling by the Brazilian Government and their advisers of the four or five million bags that were at one time thrown on their hands, which many people at the time strongly advised should be towed out to sea and sent to the bottom of the Atlantic. The results over the coffee deal, not unnaturally, is being brought up as a proof, or at least as an excuse, that the valorization of cocoa could be made the same conspicuous success, and as both schemes have the Brazilian element behind them they are the best judges of what they have done, and so feel they can do again. Meanwhile, we understand that a meeting is being or has been held by the Chamber of Commerce in Bahia, in connection with the Brazilian Government, to discuss the question of the valorization of cocoa, and that amongst those attending is M. de Sequier, Portuguese Consul-General in Paris, representing, I take it, San Thomé, who has been in Bahia since the middle of August, carrying on the negotiations that started in Paris. Valorization therefore is certainly *sur le tapis*, whether it will become *un fait accompli, on ne peut pas encore le dire*.

According to the London *Economist*, Ecuador and San Domingo were also included in the scheme. The same authority, quoting the *Frankfürter Zeitung*, wants to say negotiations have fallen through, and evidently considers, from the tone of a paragraph that it published in its issue of October 7th, that the whole idea was done for, and was doomed to failure from the beginning. The same thing was said of the coffee valorization scheme. The German speculators naturally do not want the proposals consummated, and so it is only natural that the papers speaking from their side of the case would like to see the matter dropped. If this is their meaning, we do not agree with them; the idea may never become a fact, but I do not think those who are responsible for the scheme have lost hope yet, and I believe further meetings are being held at the time of writing.

Coming to more ordinary topics, we have, of course, got over our troubles in London arising out of the August strikes, and though prices remain steady, the market has settled down to a very humdrum state. Whether, as some assert, the drought having driven up the price of sugar is discouraging makers from buying, and, we suppose, manufacturing cocoa so freely as they would when sugar was lower, and so has spoilt what promised to be a good market, I am not in a position to say; but as so much cocoa essence, requiring no sugar in its manufacture, is now made and sold, the high price of sugar cannot play a very important part in bringing about the subdued state of the market. The mild weather, extending as it has done right into October, certainly has not increased the demand for drinking cocoas, for although I see Sandow, the strong man, has entered the lists as a maker and seller of the "food of the gods" to make us all as strong and Apollo-like as himself, yet even he will not make the students at his schools, or the general public outside, drink cocoa to the same extent during the tropical summer weather we have experienced as they will do when the weather is damp and raw, if not downright cold.

Last month, my readers may remember, I queried the Lisbon receipts and returns. Messrs. Martin Weinstein and Co., of Lisbon, however, assure me that their receipts given at the end of August (310,600 bags, against 296,500 last year) were quite correct. During September 20,530 bags came to hand, making 331,183 bags for the nine months, against 382,203 bags last year, and 319,381 in 1909, whilst the stocks in Lisbon have been reduced to so low a level that one cannot help wondering into whose warehouses the cocoa that has disappeared since last year has gone. Here are the figures:—

Lisbon Stock on August 31st	51,359 bags	
Arrivals during September	20,530 ,,	
Makes ...	71,889 ,,	
Less deliveries in September	28,888 ,,	
Leaves Lisbon Stock, September 30th, 1911	43,001 ,,	
Against ,, ,, ,, 1910	129,554 ,,	

As it is estimated that during the course of a year some 40,000 bags of San Thomé go direct, nowadays, to ports other than Lisbon, and so do not appear in any returns, this very substantial quantity must also be thought of in connection with the invisible stocks. Meanwhile, Havre quoted San Thomé at Fcs. 74 to 76, against Fcs. 64.50 to Fcs. 67 last year, or nearly Fcs. 10 higher, whilst Bahia (thinking of the Pan-Portuguese valorization scheme) is quoted Fcs. 69.50 to 77, against Fcs. 61 to 68 in 1910, and Pará Fcs. 73 to 78 against Fcs. 65 to 68. The Bahia exports to the end of September amounted to 393,581 bags, against 261,520 last year, and 294,899 bags in 1909.

Havre stocks and prices on September 30th were as under:—

Havre Stock. September 30th, 1911—	Bags.	Value. Fcs.	1910. Bags.	Value. Fcs.
Pará	23,408	73 to 78	37,429	65 to 68
Bahia	19,494	69.50 ,, 77	25,879	61 ,, 68
Venezuela ...	57,242	72 ,, 200	61,341	63 ,, 160
Trinidad ...	45,417	74 ,, 77.50	57,173	66 ,, 69
Grenada and other W.I....	3,500	68 ,, 76	4,720	62 ,, 67
San Thomé ...	17,398	74 ,, 76	8,804	64.50 ,, 67
San Domingo	11,790	66 ,, 68	11,399	58 ,, 63
Haiti	5,650	56 ,, 71	14,797	51 ,, 64
Accra	38,387	67 ,, 70	16,927	58 ,, 62
Guayaquil ...	15,061	72 ,, 78	9,822	67 ,, 82
Others... ...	20,980	—	24,908	—
Total ...	258,327 bags		273,199 bags	

During September 22,503 bags were landed in Havre, and 39,358 delivered, so that the stock has been reduced nearly 17,000 bags in the month.

In London our figures have also grown less, say:—

London Stock, October 7th—	1911. Bags.		1910. Bags.
Trinidads	7,995	...	9,655
Grenadas	10,726	...	11,410
Other W.I.	6,635	...	4,792
British West Africa ...	2,945	...	2,841
Portuguese West Africa ...	2,770	...	1,604
German West Africa ...	6,336	...	1,827
Ceylon and Java	14,851	...	14,150
Guayaquil	43,263	...	34,094
Brazil and Bahia	1,195	...	1,109
Other Foreign	10,478	...	13,200
Totals ...	107,194		94,682

Meanwhile the Board of Trade returns for the United Kingdom show an increase in the deliveries for home consumption of 442 tons for the month of September (2,240 tons against 1,798 tons last year). The exports were also heavier (814 tons against 416). The landings were, however, rather light, say 1,500 tons against 2,200 tons. The nine months work out as under:—

Raw cocoa only—	Landed.	Del'd. H.C.	Export.	Stock (Sept. 30th)
Jan.-Sept., 1909—	26,725	17,816	4,743	9,170 tons
,, ,, 1910—	23,690	16,778	5,034	10,313 ,,
,, ,, 1911—	25,331	18,095	5,213	11,589 ,,
	Incr. 1,641	Incr. 1,317	Incr. 179	Incr. 1,276 ,,

Prices according to the last business done, including the sales on October 10th (no sales were held on October 17th) run as follows:—

Trinidads.—Good mid-red marks sold at 62s. to 63s., whilst mid-red were worth 60s. to 61s. 6d., and fine to superior 63s. and up. At the sales on October 10th good mid-red, however, sold at 64s., so other qualities must be valued proportionately.

Grenadas.—Fine marks at 60s. to 61s., fair to good red 57s. to 58s., common unfermented 56s.

Jamaica.—Good to fine marks 57s. 6d. to 59s., ordinary unfermented to good fair 54s. to 57s.

Dominica.—Good marks up to 58s., good fair reddish 56s. 6d.

St. Lucia.—Fine marks up to 60s., fair to good 55s. 6d. to 58s.

Montserrat.—Fine bold realized 75s.

Samoa.—Fine bold sold at 73s. to 74s.

British West African.—Greyish red realized 49s. 6d. to 50s. 6d., but the best is valued up to 56s., although I have not heard of any sales at that price; dull reddish sold at 55s. This is on a par with the present quotations of 58s. to 60s. for San Thomé and Cameroon cocoa.

Bahia superior is valued at 62s., but no sales are reported. A pile of 100 bags has just arrived, and these will show what the spot value is as compared to "valorization" ideas.

Guayaquils continue to sell slowly, whilst the receipts and stocks mount up. Fine Arriba last sold at 66s., and fair down to 59s. 6d. Fine Caraquez up to 59s. 6d., and greyish at 57s.

Ceylon.—Prices are steady for fine, or would be, were any available. The best price lately has been 73s. for good bold, whilst fair medium realized 66s. and upwards.

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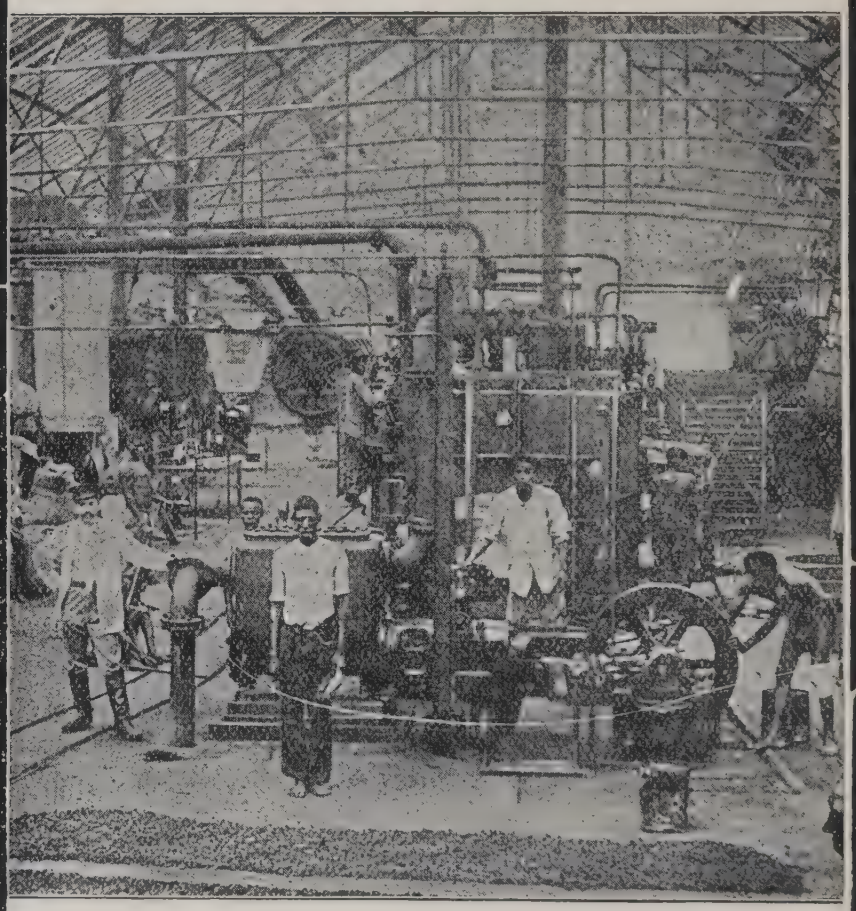

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A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

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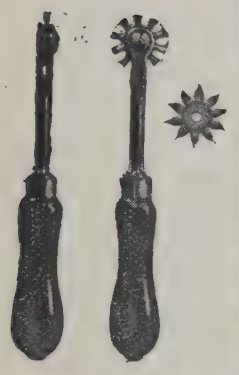

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"Tropical Life" Prize for the best Essay on the Fermentation of Cacao.

As already stated, we were compelled, out of fair play to all concerned, to postpone the final date for the reception of the essays on the above subject for twelve months, that is, until January 31st next (1912). Those who are arranging, therefore, to send in essays must begin to think of doing so, if they wish to be in time. The eighteen or twenty firms who have subscribed towards the prize regret that so far only two names have been sent in, and trust that at least a dozen essays will be received from those competent to write such a treatise as is asked for, as they are most anxious to obtain reliable information on the subject. The information given must be based on practical experience and not on theory, and unless the results are of scientific and practical value, and the points raised are answered in detail, no prize will be awarded; that is to say, a useless essay written by one unable to add to our knowledge on the subject, will not gain the prize simply because no one sent in a better and really useful essay, the subscribers, however, will be only too willing to award the prize if the queries raised are properly answered.

The following gives full details of the subject on which the essay is to be written. Papers sent in, therefore, must be able to treat the matter from a scientific as well as from a practical point of view, as the main object is, as stated, to obtain exact particulars of the biological *as well as* the chemical changes that take place in the bean during the process of fermentation.

THE FERMENTATION AND DRYING OF THE CACAO OR COCOA BEAN (*Theobroma cacao*).

The essay should record precisely and in full detail the changes resulting from the processes of fermentation and drying that take place in the bean from maturity in the pod to the time of putting the cured beans into bags for market. Biological as well as chemical changes should be noted. The action of maximum, minimum and optimum temperatures, and of checks producing differences of times in the fermentation and drying processes should be noted for every stage. The differences due to such variations on the resultant cured bean should be clearly traced. The possibility should be discussed of producing at will by such variations, and independently of the natural character of the bean, varieties of taste and of colour, both internal and external, so as to simulate the different kinds of cocoa known on the market. Alterations that might be made in ordinary methods so as to improve the quality of the cocoa should be explained. Waste products should be considered, and their potential value indicated.

The Coming New York Rubber Show.

MEXICO'S CHANCE TO VINDICATE HER POSITION AS A LEADING RUBBER-PRODUCING CENTRE.

As stated in our last issue, Mr. Staines Manders, supported by his able lieutenant and secretary, Miss Fulton, has arranged, in collaboration with the leading officials attached to the International Exposition Co., of New York, and others, to hold the third International Rubber and Allied Trades Exhibition at the New Grand Central Palace, in Lexington Avenue, New York. We include a block

Where the Third International Rubber Exhibition will be held from September 23rd to October 3rd, 1912.

of this building showing its size, and yet, large as it is, we understand that the area required to be placed at the exhibitors' disposal will occupy three floors. Go-ahead as the Americans are in many ways in connection with rubber and rubber problems, their best friends were willing to own last July, that if the English show could have been dropped in the centre of New York or Akron, the American manufacturers, and especially the Mexican-American planting companies, would learn practical lessons in a way that even a trip to the East could not drive home to them. It was the assortment, and the bringing together of the various rubbers, and of the rubber producers and experts from each of the producing centres that enabled those who visited Olympia in 1908, or the Agricultural Hall this year, to learn so much concerning this important raw material. Now the Americans are to run their own school, and the classes will be opened from September 23rd to October 3rd inclusive, that is to say, for ten days. We are glad to hear this, as America will see what the British Colonies can do in the way of rubber production (we take it for granted that Malaya, Ceylon, the West Indies, &c., will take space there as they did in London), and this will cause the United States to push ahead with her manufactured rubber industries, and the British producing centres will reap the benefit.*

Another centre that we sincerely hope will come right to the front at the New York show is Mexico. We were very disappointed that this Republic did not include a national exhibit similar to that of Brazil at the Agricultural Hall, but were ready to make allowances as we knew how very disturbed her home politics were at the time. In ten months from now, however, unless the last stage of the country is to be worse than the first, the unrest in Mexico will have passed away, so we hope that the Government will lend a more willing ear to its well-wishers and advisers than its representatives found themselves able to do in London, when they were urged to take a prominent position at the London Exhibition. This advice was not only given by Mr. Staines Manders, but also by those who had no financial interest in the exhibition, and who were not even interested in Mexican planting investments, although such men would have liked to have seen Mexico exhibit on a national basis to balance that of Brazil, as Ceylon's did with Malaya, or the Netherlands with Germany. Well-wishers for and believers in Mexico's future wanted her to have taken her place among the other producing centres, as they believe that, if given a chance, she can produce rubber in large quantities to pay—not from one estate, but from many; not only from Castilloa, but from Hevea as well; not only in the crude rough manner of twenty-five years ago, but on the most scientific and up-to-date lines, as adopted by the Eastern planters. But to do this the American-Mexican planter must go to school and learn. He neglected doing so in 1908, and again this year; but next year the Central Palace show offers a third chance, one, too, under most favourable circumstances, surrounded by those who have sunk so much money in the country, and within train reach of her chief cities. Having, therefore, let the first two chances slip, we hope Mexico will not let this one go as well. It is the chance of a lifetime for her, and there is no saying when she will get such another. At this critical stage of the Republic's career, she must not lose a single opportunity of advertising and exhibiting before the

* Rubber planters will be pleased to hear that the Antwerp friends of Messrs. Zorn and Leigh-Hunt report that the famous stock of the Banco do Brazil is gradually dwindling away by way of private sales, and that at present not more than about 1,500 tons remain to be sold. Moreover, prices are now near the level at which it will not pay to produce reclaimed rubber, Jelutong, and many other substitutes which came on the market during the memorable boom of 1910. In America consumption is steadily increasing, and it is said that during the present year nearly 300,000 motor-cars will be manufactured. They also state that the Pará crop of 1911-1912 will most likely not exceed the last one; that the output from the Congo is continually declining, and that the actual yields of the plantations in the East are remaining behind the original estimates owing to the unforeseen drought. Considering these facts, they are of opinion that present prices discount a large part of any "bear" arguments, so that the future development of the market may be looked for with confidence.

investing world her wonderful resources as a producing centre on the one hand; and on the other she sadly wants to learn herself how to make the most of her possibilities. A national exhibit of Mexican rubber, therefore, must be one of the most prominent features at the New York show in 1912. Mr. Henry C. Pearson, editor of *The India-rubber World*, of New York, has kindly consented to be the active Vice-President of the Show.

The Cult of the Coco-nut.

THE QUESTION OF MANURING.

IT is commonly asserted that the uses of the coco-nut palm are as numerous as the days of the year. Apart from local uses, where the leaves serve as roofing, the mid ribs for basket-making, and the hard shell for domestic utensils, the more important commercial commodities are, in the first place, the dried kernel known as coprah, from which a valuable oil is expressed; then comes the fibre from the pericarp, which envelops the shell, used for ropes and cordage; and lastly, the sap from the young stems and blossoms, which, when fermented, provides us with arrack and a good quality of vinegar. With such an important plant it may be of interest to give some details as to the methods of propagation, planting, cultivation, and manuring.

As has been proved with other cultivated plants, such as wheat, due attention to seed selection is bound to give increased yields. Seed-nuts should be selected from trees that are known to be good, regular bearers under ordinary conditions of soil and climate,* and though this may be generally recognized, the method of picking the nuts, even from specially selected trees, is often careless, and tends to destroy this initial advantage. The nuts, of course, should be completely matured, and from this point of view many argue that they should be allowed to fall naturally from the trees. This involves considerable damage to the young embryo, and careful hand-picking, if by reliable and experienced hands, is preferable. To accomplish this the stems of the trees are notched, and this is often done in such a way that little cups are formed, where water lodges, and so sets up decay. Notches are perhaps necessary, but they should always be carefully cut, not too deep and sloping downwards, so as to minimize the danger as much as possible. The ripe nuts are then stored in a dry place for about six weeks, since, if this is not done, the food store in the nuts is liable to decay. A corner of the plantation, preferably under shade, with sandy or well-drained soil, is selected as a nursery, and the nuts are laid lengthwise in shallow trenches and lightly covered with soil. A handful of kainit applied to each nut is of an advantage, as this tends to prevent the ravages of such pests as white ants. From the nursery the young seedlings are removed to the plantation, and this is best done just before the commencement of the rainy season. In removing the seedlings care should be taken to leave the roots as entire as possible, and that no injury be done to the young shoots, especially at their junction with the nut. This transplanting stage is open to many grave dangers. For instance, the young roots may be damaged, and since the function of transmitting water upwards to the leaves is thus impaired, it is advisable to cut off about ⅓ of the leaves, so as to regulate the evaporation from the leaf surface. But another danger is presented in that the period of transplanting may just coincide with the exhaustion of the natural food store in the nut, and before the seedling has developed sufficient power to extract the necessary food material from the soil by the fine root hairs. This stage occurs about six months after the appearance of the cotyledon or seed leaf, and a period of about three weeks elapses before the seedling has accommodated itself to the new situation. Recognizing this danger, there are many who maintain that the nursery stage is unnecessary, and that the better method is to leave the nuts in piles of ten to twelve, and transport the nuts when sufficiently sprouted direct to the plantation. Those who advocate this method claim that not only is the expense of the nursery work avoided, but weakly plants can be readily seen and rejected. When one considers that in Ceylon two transplantings are carried out, the second when the plants are a year or so old, the nursery method, when practised with reasonable care, is perhaps more advisable. In the plantation the palms should never be less than 25 ft. apart each way, and planted in ordinary orchard form, but 30 by 30 ft., or 48 to the acre, is generally found best.

[*Reproduced from "Coco-nut growing in the Philippines."*

Sprouting coco-nuts ready to plant.

A few notes may now be made on the conditions of the soil most favourable to the growth of this palm. Without entering too far into the realms of botany, it is necessary to remember that the roots are large and fleshy instead of fibrous, and this points at once to the necessity of having a fine permeable soil. That fact alone explains why coco-nut palms are naturally found along the seashore, where the soil is of a sandy nature. But the seashore has other advantages. It is now generally recognized that the plant-foods are taken up in dilute solution, and the water so absorbed is then transpired through the large leaf surface. Naturally, then, there is a distinct connection between the transpiration through the leaves and the amount

* In our October issue, p. 199, we give full particulars of the San Blas nuts and their advantages for planting.

of plant-food taken up, and where the palms are situated in a good airy position the vigour of the trees is best assured. Fully exposed to the prevailing wind, with a more or less constant supply of water, the palms yield profitable harvests of nuts, and on these coastal tracts it is only necessary to avoid storm centres, where violent gales would tear the leaves and dislodge the young nuts, to ensure success and obtain regular profits.

From what has been said, one can realize that soils of a clay formation, where drainage has received little attention, are unsuitable, but though the growth of the trees is practically governed by the water supply, stagnant water is detrimental, as the feeding area of the roots is limited to the surface, and the palms are more readily blown over by the wind. Sheltered valleys should also be avoided, though the poor yields from inland plantations can be largely attributed to the lack of water in the subsoil, too close planting, and the apparent indifference of the native planters towards any improvement either in the way of thinning out the trees or by undertaking some form of cultivation to produce a more friable condition of the soil.* By adopting scientific methods of cultivation the environment of our economic plants has been greatly extended, and it is possible to create conditions under which these plants thrive just as well as in nature, and in many cases far better. So one hopes to extend the region of coco-nut culture from the coastal areas to the inland districts through due attention to seed selection, irrigation and drainage, planting in orchard form, so as to have the maximum amount of light and air, and regular cultivation and manuring to restore the plant-foods removed by each harvest of nuts.

In the August, September, and October numbers of TROPICAL LIFE several interesting articles dealing with coco-nut palms have appeared, and so, to avoid repetition of the information given there, we shall confine our attention to the manuring question. Those acquainted with coco-nut plantations are quite aware that the trees in the neighbourhood of the stations are frequently more vigorous and produce larger crops than those even a few hundred yards distant. The natives attribute the larger return of nuts to a form of gratitude on the part of the trees for their inclusion in the family circle, but the real reason lies in the fact that such trees get more attention in the way of manure from the cattle sheds and other refuse of a fertilizing character. Not only is a higher yield noticeable, but the nuts are larger, and young trees on the plantations near the stations come earlier into bearing and yield even at their fifth or sixth year; whereas, in ordinary cases, a period of from eight to ten years usually elapses before the trees produce nuts. This is by no means a small consideration, for a quicker return on the outlay is thus assured. Experiments on the manuring of coco-nut palms have not yet been conducted on any large scale, and up to the present we have only the guidance of the analyses of the various products removed by a year's harvest. Dr. Backofen has shown by analyses that a crop of 1,000 nuts, *i.e.*, the produce of half an acre, removes the following quantities of plant-food from the soil:—

Nitrogen	8.6 lb.
Phosphoric Acid	2.4 ,,
Potash	18.7 ,,
Lime	2.3 ,,
Salt	21.4 ,,

making a total of 53.4 lb. of plant-foods removed from the soil of half an acre by the crop alone, and

[*Reprucoded from "Coco-nut growing in the Philippines.*

A YOUNG COCO-NUT TREE FRUITING HEAVILY.

Other trees of the same age in the background are bearing no fruit, because they are set too close together. Their leaves form a fan-shaped mass instead of the hemisphere of foliage which is characteristic of the perfectly developed coco-nut tree.

besides this the trees have also to be considered and provided for.

These figures give us a working basis on which we can build up a manure mixture to replenish the soil with the more important plant-foods. Assuming that 50 trees go to the acre, and that the average harvest is 50 nuts per tree, then this means that 21½ lb. nitrogen, 6 lb. phosphoric acid, and 47 lb. potash are removed. These figures are taken from the analysis of the nuts,

* See "Notes on Cultivation" in TROPICAL LIFE for October, p. 200.

and, allowing for the growth of, and nourishment for the trees, we arrive at the following figures:—

Nitrogen	29 lb.
Phosphoric Acid	14 ,,
Potash	74 ,,

Before deducing a suitable manure-mixture from these figures we must take certain considerations into account. The palms are known to be heavy feeders, but if found under suitable soil conditions, then the roots have a wider ranging power, and can draw to a greater extent on the original or latent supply of plant-food in the soil. Then, on a young plantation, it is assumed that suitable methods of cultivation will be adopted, and for the first two or three years catch crops of marketable value, such as corn and mountain rice, may be grown between the lines. The yields from these catch crops will usually balance the cost of cultivation, but after the fourth year the leaves of the palms will have spread over the rows sufficiently to create too dense a shade for catch crops. Cattle manure is rarely found in sufficient quantities for large plantations, and to supply humus, which is useful to conserve the moisture in the soil, a legume crop, such as velvet beans or cow peas, can be grown, and this, when lightly ploughed under, supplies the soil with nitrogen, which the bacteria on the roots have the power of building up from the free nitrogen in the atmosphere. On a fairly heavy soil a legume crop is of considerable value, since the roots open up and aerate the soil.

Bearing these facts in mind we can recommend the following mixtures:—

No. 1			No. 2
100 lb.	...	Sulphate of ammonia ...	120 lb.
150 ,,	...	Bone meal	200 ,,
50 ,,	...	Superphosphate	60 ,,
100 ,,	...	Kainit	100 ,,
50 ,,	...	Muriate of potash	70 ,,
450 lb. per acre			550 lb. per acre

The first mixture is suitable for application during the first three or four years, but as soon as signs of the formation of nuts are observed, then the second mixture should be applied, in order to stimulate the trees as much as possible. Where green manures have been ploughed into the soil, then the quantity of sulphate of ammonia can be considerably reduced. These mixtures have been based on the information gained from experiments on orchards where the effects of the various plant-foods have been more or less established. For instance, it has been found that the effect of nitrogen is to increase the size of the fruit, but in order to obtain quality as well as quantity, phosphate and potash must also be added. These play a prominent part in the formation of carbohydrates and albuminoids, and those who visited the stand of the Potash Syndicate at the recent International Rubber Exhibition, London, will remember the cross sections of the coco-nuts, where a striking difference in the amount of meat was shown between those nuts from the manured and unmanured plots. Photographs showing relative thicknesses of the kernels of these nuts have now been taken, and are reproduced elsewhere in this issue.*

* See the illustration in their advertisement, p. xv.

We have been assuming that we are dealing with newly-formed plantations, but the case is quite different when we come to deal with old plantations which may have been neglected for a considerable number of years. The vitality of the trees is naturally low, and we must make up this by the application of plant-foods before any appreciable difference can be noted in the yields. We often find in these neglected plantations, however, that the trees are too close together, and not only are the yields unprofitable, but these trees are often in a very unhealthy condition with bud rot, and are thus a source of infection to healthier palms in the neighbourhood. The first step should be to thin out the plantation till the distance apart each way is not less than 25 ft. It is hard to convince a native as to the wisdom of this, but it will be found to be work that pays. After this thinning, cultivation and manuring can be more uniformly practised. A heavy manuring should be given the first year or so in order to restore the vigour of the trees and to promote the formation of nuts. In such cases the first year's manuring may do very little beyond improving the appearance of the trees, but after the second year an increase in the crop is bound to take place. A manure composed largely of organic material is preferable, and the following mixture should give good results:—

Castor Cake	250 lb.
Tankage	200 ,,
Sulphate of Ammonia	50 ,,
Kainit	120 ,,
Muriate	80 ,,
Sufficient for one acre ...	700 ,,

As soon as the trees show a healthy appearance, then Mixture No. 1 in the first table can be applied with advantage.

"Seeing is believing" is an old adage, and most of us are sceptical in that we require to be shown actual proof of a thing before we will believe it. It is only by actual experimental work that we can hope to convince the planters that the adoption of more up-to-date methods will give increased and profitable yields, and in view of the growing demand for coprah and vegetable oils, which is creating something of a boom in coco-nut culture, owners and managers of plantations should test for themselves the value of adopting the more modern methods of cultivation and manuring suggested here.

Analyses of Fertilizing Materials.

	Nitrogen %	Phos. Acid %	Potash %	Moisture %
Goat manure, No. 1 ...	2.32	.47	3.72	37.48
,, ,, No. 2 ...	1.92	.76	3.01	20 77
Sheep manure	1.26	.59	2 54	39.66
Seaweed	1.18	.16	·93	19.22
Sugar. Filter press residue	.75	2.02	—	63.49

According to the annual report of the Porto Rico Agricultural Experiment Station for 1910, from which we take the above figures, the filter press residue, known locally as *Cachasa*, as thrown out from the sugar mills, with its two-thirds contents of water, is worth locally $4 a ton as manure. In the dry state therefore it should be worth, roughly, some $12 a ton.

British East Africa as a Rubber-producing Centre.

The Question of Wide *v.* Close Planting.

Mr. I. Stewart McCall's annual report for 1910, giving an account of his stewardship as Director of Agriculture for the Nyasaland Protectorate, is useful reading, and among other items it includes the following tables showing that wide planting does not always mean larger girth in young Pará trees. No tapping experiments have, as yet, been carried out, and present ideas seem to be not to tap the trees at all until they are seven years old. We believe all the trees mentioned below are on the lands of the African Lakes Corporation, Ltd., who have some 726½ acres under Pará (*Hevea brasiliensis*). The trees, we are told, are looking extremely healthy, and it is anticipated that the growth of the younger trees will progress more rapidly after the fourth year, when they have a sufficient root system to prevent them suffering from drought in the dry season.

Average girth measurements, taken at 3 ft. from the ground:—

Vizara Estate.—3½ years old Pará. Planted 15 x 15 ft.

Average girth of 50 consecutive trees ...	12.12 in.
Girth of best tree	14 ,,
Girth of worst tree	9 ,,

Chombe Estate.—4½ years old Pará. Planted 30 x 30 ft.

Average girth of 102 trees	9.61 in.
Girth of best tree	14.50 ,,
Girth of worst tree	8 ,,

Chombe Estate.—3½ years old Pará. Planted 20 x 20 ft.

Average girth of 100 trees	8.98 in.
Girth of best tree	12.25 ,,
Girth of worst tree	5.50 ,,

Chombe Estate.—2½ years old Pará. Planted 20 x 20 ft.

Average girth of 100 trees	4.26 in.
Girth of best tree	5.25 ,,
Girth of worst tree	3 ,,

Chombe Estate.—1½ years old Pará. Planted 20 x 20 ft.

Average girth of 85 trees	3.27 in.
Girth of best tree	3.75 ,,
Girth of worst tree	2.50 ,,

It is early days yet to predict the future of West Nyasa as a Pará rubber producing district, but Mr. McCall claims that at present, in ratio to cost of cultivation, the trees look healthy and prospects are favourable. Time alone will show what returns will be reaped, and if the African Lakes Corporation carry out their intention mentioned above, they will have to wait two-and-a-half years, even for those trees over four years old. At the end of that period, however, they will, we are sure, reap considerable benefits by allowing the trees time to become strong and vigorous. Meanwhile it will be noted that, whilst 50 trees, only 3½ years old, planted 15 x 15 ft. to the acre, showed an average girth of 12.12 in., a batch of 102 trees 4½ years old planted at twice the distance both ways, *i.e.*, 30 x 30 ft., or 48 to the acre, show an average girth of only 9.61 in., and the best tree only exceeds the best 3½ years old at 15 x 15 ft. by half-an-inch (.50). The 3½ trees planted 20 x 20 ft. (108 to the acre) show off very poorly against the 15 x 15 ft. trees of the same age, their average being only 8.98 in., against 12.12 in., the best tree 12.25 in. against 14in., and the poorest 5.50 in. against 9in. It is difficult to account for these divergencies in results without knowing how the soils compared, for although it by no means converts us to close planting, one naturally wonders why the closest planted trees in this instance are doing the best.

The British West African Association.

Nearly 200 present at the Conversazione.

As reported in our last issue, members of the above Association, with their friends, had the pleasure of attending, on October 24th, a most successful conversazione, on the invitation of Sir William and Lady Lever, at their London house, situated near the historical "Jack Straw's Castle" and the Spaniard's Road at Hampstead.

In spite of the inclemency of the weather, which was particularly uncharitable during the time the guests were journeying from their homes to Hampstead, and although many Colonials had foregathered at the Royal Colonial Institute to do honour to and to welcome Earl Grey home on his return from Canada, nearly 200 guests must have filed past their host and hostess, at the reception between 8.30 to 9 p.m., to pass either through the sweep of the picture galleries that extend to the billiard room, with its interesting collection of Japanese cabinets on the left, or to the music saloon, where many of the more important paintings were to be found, on the right. Apart from any other inducement, the pictures, which include several Constables and Romneys, and also the collection of china, would attract any art lover, of whom there were many present. We noticed, for instance, that our old friend, Mr. Leslie Radclyffe, who represents Messrs. David Bridge and Co., Ltd., in London, and who excels in hunting sketches when his duties allow him time to take up his brush, was busily engaged at several periods during the evening admiring both the pictures and the china.

When the time came for the guests to separate, all declared that the evening had been a great success in every way. There is no doubt such gatherings come as a welcome change in the rather strenuous life one has to lead to achieve the object you are striving after. To be able to stroll, therefore, among so fine an art collection, whilst still, perhaps, discussing matters not altogether disconnected with tropical development, or to rest in the salon and listen to the well-rendered songs and pleasant music, with which those present were entertained, enabled members to become better acquainted, and at the same time to enjoy a pleasant spell of recreation after the striving and stress of the day. When the Association becomes a strong and influential body, as it will do, if the members work well and give their rather overworked honorary secretaries more assistance than they have done up to now, they will, we are sure, feel that they owe a great deal to the impetus given to their cause by Sir William and Lady Lever's reception.

Irrigation for Ceará Rubber.

We are glad to see by their report that there is at least one company on the West Coast of Africa which believes in stumping and irrigation. This is the Kibwezi Rubber Lands, Ltd., the directors of which in their report stated that the area at present under rubber is 202 acres, containing 73,100 trees. Twenty-three thousand of these, growing on the Makuyu section, are under irrigation and, according to the latest reports, were growing splendidly, showing that irrigated Ceará was an undoubted success. Nine hundred acres also had been cleared and "stumped"; this area will be planted with 400,000 trees (planted 10 by 10 ft. and also placed under irrigation. Furthermore, we are told that Mr. G. K. Watts, ex-Commissioner of Public Works, had been engaged by the board to survey and lay out an effective irrigation scheme. As a result, Mr. Watts had surveyed and proved that some 6,000 acres were suitable for irrigation.

The manager reports that all the new plantations will be under effective irrigation by the end of January next year. The results of this enterprising company should be watched with interest by all those planting Ceará rubber, and may be by others as well. We have so often urged our planting friends to at least carry out experimental plantings of Ceará under irrigation in British East Africa and elsewhere where the rainfall was unreliable if not rather scanty, that we shall watch the Kibwezi results with great interest. Irrigation has one great advantage over a heavy rainfall, namely, that irrigation water can be turned on or withdrawn from the land as required, the trees thereby receiving what they need to a nicety and no more, nor will the water lay stagnant about their roots. Coco-nuts, sugar-cane, and other crops also benefit largely under similar conditions.

Two estates which interest us, because they are both entirely devoted to Ceará rubber (*M. glaziovii*), are the Mkumbi and Manihot estates, of which we gave some particulars in our June issue. We were therefore glad to see in *Industrial Notes and Queries* that there is some chance of the two estates being amalgamated. If this were done there would be, according to the published accounts, a total of 600,000 trees on the amalgamated estates; at any rate, we are told that there are 271,900 on the Mkumbi, of which 175,000 trees were stated to be "tappable" in October, 1910, and if this is correct there should be some 325,000 on the Manihot estate. The Directors were disappointed at the yield from the Mkumbi estate, and the shortage of tappers was not a sufficient reason for the small returns; it must have been due to other reasons. We believe, however, that were irrigation introduced, to be used if necessary, as on the Kibwezi estate, and the trees treated with nitrate of soda occasionally, as was so successfully done in Hawaii,* the yields from the trees would be more satisfactory. The Mkumbi's 175,000 trees certainly should give ¼ lb. per tree, or about 45,000 lb. as their 1911-1912 crop, and will do so, if the trees are well looked after.

* We have published the articles which appeared in Tropical Life on rubber manuring as two reprints, and shall be pleased to send copies to anyone sending a penny stamp for postage.

Mr. Lewton Brain on Smoked Rubber.

Those interested in tropical buildings, smoke-houses, &c., for rubber estates, should pay careful attention to the following paragraph in the 1910 report of the Director of Agriculture (Mr. Lewton-Brain), F.M.S.:—

"The manufacture of rubber may best be described as still in the experimental stage, neither buyer nor seller knowing sufficiently the kind of rubber that is best for manufacturing purposes. What is most wanted in the industry is a simple and reliable test for the strength of the rubber as it leaves the plantation factory, comparable to the polariscope test for sugar. At present there seems to be a preference for smoked rubber, and many estates are contemplating the erection of smoke-houses, and will be turning out smoked sheet largely in place of the hitherto favoured crêpe.* The smoke-houses are usually two-storied, the rubber being hung, as taken from the rollers, in the upper floor, while fires are kept going below; openings of various sizes and descriptions are made in the floor between the two stories. Coco-nut husks form about the best fuel obtainable in large quantities, and it is quite probable that estates which have coco-nuts planted up as a secondary crop will find them of great value for this purpose alone, as the demand for husks will increase considerably in the next few years. The movement appears to be quite a sound one, as there is little doubt that properly smoked rubber is actually stronger and better than unsmoked, apart from all temporary fashionable demands."

According to the Director of Agriculture's report for 1910, some cacao plants from Ceylon were planted at Kuala Lumpur. A few of these continued to do well up to the end of the year, but the majority failed, probably on account of the poor soil and dry situation.

Re Colonial Bank and the West Indies.

To the Editor of Tropical Life.

Sir,—Referring to the article on Agricultural Banks in your October issue, I am always interested in this question, but for the peasant and small proprietor, I believe a system on the lines of the German Credit Banks would be preferable. People say that they (the German Banks) are not adapted to the negro, but they said the same of the system of agricultural instructors, when they were started by Mr. Fawcett in Jamaica. In spite of adverse criticisms, however, the system has taken hold, and is doing an enormous amount of good in the West Indies, especially in Jamaica. I believe now that Credit Banks, with a good system of co-operation, worked in every district, would more than treble the value of the instructor system. The Credit Banks are, I believe, working well in India.

Very truly yours,

Jamaica.

October 26th, 1911.

* We referred in our report of the rubber shown in the Malay and Ceylon Courts at the Rubber Exhibition to the advantages of pale blanket sheets, and in the Ceylon Court many of the estates were showing such rubber.

Rubber Prospects—The Question of Supply and Demand.

AVAILABLE statistics, Dr. Schidrowitz tells us in his book, "Rubber,"* gives a total of 85,000 to 88,000 tons of raw rubber needed for consumption. "In making these calculations," he adds, "I have not taken into account any drawing on reserve stocks, but these, in any case, could not affect the figures to any material extent. A consideration of the known sources of production leads me to believe that the present (1911) production is at the rate of 86,000 to 93,000 tons, exclusive of certain low-grade gums." Speaking of future prospects, this authority states:—"What the future production of rubber may be is largely a matter of speculation, but increases may be looked for in the following directions:—

"(1) *From the Plantations.*—In the absence of any wholesale calamity, there should be produced from Eastern plantations in 1915-16 at least 70,000 to 80,000 tons. The plantations in other parts of the world (Africa, Mexico, Brazil, West Indies, &c.) may yield another 10,000 tons.

"(2) *Industrial Rubbers.*—An increase of, certainly, 5,000 to 10,000 tons (from Jelutong, Guayule, and Vines) should take place.

"(3) *Selected Forest Areas Worked on Plantation Lines.*—A probable increase of 1,000 to 2,000 tons is to be expected.

"On the other hand, we may expect that perhaps 10,000 tons of low-grade or improperly-prepared rubbers from Africa, Asia, and South America will disappear. On balance, therefore, and assuming that the Brazilian supplies and Guayule do not fall off materially, there will, in 1915-16, be an increase of production over 1911 of, roughly, 60,000 to 70,000 tons; that is to say, a total production of 145,000 to 160,000 tons."

"It is difficult to prophesy with regard to rubber," says Mr. Lewton-Brain in his 1910 report, "but I should judge that for the next four years the increases for Malaya should be at least 10,000,000 lbs. for 1911, 15,000,000 lbs. for 1912, 15,000,000 lbs. for 1913, and 20,000,000 lbs. for 1914, *provided that the supply of labour is sufficient to perform the necessary tapping and other agricultural operations on the acreages opened up during the past few years.*† After that the output should show a steady increase for the following four years, provided, of course, that nothing unforeseen arises to cause the abandonment of already planted land, after which the increase may be slighter. In 1916 the output for Malaya should be at least 65,000 tons, on the present acreages alone."

MESSRS. SCRUTTON, SONS AND CO. (9, Gracechurch Street, London, E.C.) advise us that the present tariff of outward freights to the British West India Islands (except Jamaica) and British Guiana will be cancelled on December 31st next.

A revised tariff, particulars of which will shortly be circulated, will be applied to all steamers leaving the United Kingdom for the West Indies on and after January 1st, 1912.

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* Price 10s. 6d., or 11s. 6d. post free.

† The italics are ours.—[ED. T.L.]

Root Pruning.

ALTHOUGH treating only of fruit trees in the temperate zone, the London *Daily Telegraph*, which devotes a page once a week to "Gardening Notes," recently included some very useful hints on tree pruning, illustrated with two line-drawings to show exactly the various processes that they describe. In the course of his remarks, the writer of the article, Mr. Donald McDonald, F.L.S., explains that although fruit trees, and, we would add, often other trees as well, do not bear well at times, and show signs of needing attention, the untrained or careless grower rarely takes Nature's hints to look after the trees when they show signs of distress. If a tree can be made to become fruitful by any other means than root-pruning, such means should be adopted, because root-pruning not only is a strain on the tree, but in the Tropics it tends to attract root disease or other trouble to the trees. By checking leaf production, Mr. McDonald points out, we check the production of roots, and that is sometimes better than the violent process of cutting the roots off.

Your object, whatever the tree, is to produce as large a crop as possible, and to do this a good root and leaf growth must be encouraged. If it is necessary, for one reason or another, to keep the trees within prescribed limits, then their excessive growth and mere root production should be checked by pruning; at the same time a wide area in which the roots can spread, or a luxuriant crown of leaves, generally gives the best results whether apples or pears at home, cacao or rubber milk in the Tropics. In stiff wet soils the roots need more severe pruning than those in dry soils. In any case the operation must not be overdone, be the tree large or small, and the stronger and more luxuriantly it has grown, the greater will it feel the shock of the pruning operations, and with a large tree beneficial results cannot always be expected during the following season, as the patient needs time to recover from the effects. With old trees, concludes Mr. McDonald, it would be courting disaster to cut away closer than, say, 5 ft. from the trunk.

A Proposed Public Library for Kuala Lumpur.

AN influential body in Kuala Lumpur lately issued a well-worded appeal for funds to establish a Free Library in that town. It is proposed to stock the library with the best books published in any language spoken in Malaya, on all subjects, scientific, historical, religious or literary, so as to enable all those who wish to acquire knowledge or otherwise educate themselves to have the chance to do so. This is a most laudable object, and we trust and believe that it will be crowned with success. We have derived so much recreative pleasure and profit ourselves from libraries, both public and private, that we fully realize what they can do for an individual, a town, or the whole nation, by enabling each to do better work for the good of the whole. A library in the Tropics that we shall always have kindly memories of, is that established in Port of Spain, Trinidad (W.I.), and since we were there it has, we believe, been greatly extended and housed in a grand building of its own.

The Forests of the Philippines.

By Our Philippine Correspondent.

"The Forests of the Philippines" is the title of a notable bulletin just issued by the Philippine Bureau of Forestry under the direction of Major George P. Ahern. The author is Dr. H. N. Whitford, Chief of the Division of Investigation, who, in a course of studies extending for several years and covering practically all accessible portions of the archipelago, has gathered together and embodied in this bulletin by far the most complete and authentic discussion of the subject which has yet been prepared. The book will be found of great value by all who are interested in the forests of the Philippines and their products, whether the point of view be that of a scientist, a business man, or a lover of Nature. In many respects the forests of the Philippines are among the most varied and wonderful in the world, and now, almost for the first time, there is given the layman an opportunity to learn how to know and to appreciate them.

The bulletin is published in two parts. Part I gives a discussion of the general types of vegetation with estimates of the extent of the virgin forest, second growth forest, grass lands, and cultivated areas. The forest itself is discussed under twelve separate types, five of which are known as the Dipterocarp types, comprising seventy-five per centum of the entire area of the virgin forest, and which form the bulk of timber manufactured in the Islands. The Molave, Mangrove, Beach and Mossy types are treated more briefly and a discussion of their economic importance is also included.

Under the general heading of "Wood Uses" is given a brief discussion of the kinds of wood employed for different purposes, such as house construction, piling, wharf building, rail-road ties, &c. "Lumbering in the Philippines" is another heading. It contains a discussion of the market, logging, and milling operations, transportation, and labour. Dr. Whitford estimates the annual cut of timber at eighty-eight million board feet. The number of steam saw mills has increased from thirty-one in 1907 to sixty in present operation. Under "Minor Forest Products" are discussed such subjects as fuel, resins, oil, gutta-percha, almaciga, rubber, &c. An exceedingly valuable feature of the bulletin is a number of diagrams showing from just what sources all of these minor products are derived. For instance, on page 57 is a table showing the sources of wild and cultivated gutta-percha and rubber, including all of the trees in the Islands from which these two products may be obtained. There is also a chapter of the bulletin devoted to a discussion of the relation of the Government to the forests and their products; here is shown by diagram how the Government disposes of the forest products and what the charges are. How long-term exclusive licences, or "concessions," may be obtained is also fully discussed. Part I is illustrated with twenty-eight full-page plates, which add greatly to its usefulness.

Part II treats of the "Principal Forest Trees." Non-technical descriptions are given of one hundred and six trees, which include all of the principal timber species whose lumber is of importance in the commercial markets. Brief mention is made of some two hundred and seventy-seven other trees of the Islands that are found in the forests or else are cultivated for ornament or for fruit. This part of the bulletin contains one hundred and three illustrations, showing the bark, leaf, and wood characteristics of the principal species.

The bulletin is sold at the price of $1.25 per copy, postage prepaid. All requests should be addressed to the Director of Forestry, Manila, Philippine Islands. Remittances should be made only by P.O. money order.

The Hemp Industry in the Philippines.

The Philippines are going ahead in their adoption of labour-saving devices. The latest of these has been, we see by the *Mindanao Herald*, the installation of a modern, up-to-date hemp press by Messrs. Behn, Meyer and Co., Ltd., in their Zamboanga bodegas. The press, a Bijoli, manufactured by our friends, Messrs. Shirtliff Bros., of Hampton Hill, Middlesex, England, is the first of its kind to be brought to the Islands, and can be operated by hand or power. An American Fairbanks 20-h.p. gasoline engine will furnish the power for the press, and the plant will have a guaranteed capacity of three hundred bales per day.

Messrs. Behn, Meyer and Co. have put up this press with the intention of placing Zamboanga and the Moro Province in a position to deal with hemp in the most profitable manner. The services of an expert classifier, with many years experience in the Islands, have been secured. The company has announced that they will classify and bale the hemp of planters and merchants at very reasonable rates so as to enable them to put their product on the market graded and in accordance with the usages of this particular trade.

The establishment of this press fills a long-felt want and should be an important factor in building up an extensive hemp export trade direct from the Moro Province to the markets of the world. It is to be hoped that this new enterprise will be duly appreciated by all who are interested in hemp. The new press is bound to be a great stimulus to the business of the Province.

In answer to "Cacao Planter," the late Mr. Hinchley Hart, in his book on cacao, when discussing the different patterns of Wardian cases for transporting cacao seedlings says that those cases whose lids go up to a sharp point are best for the plants, whilst those with a flattened top cost slightly less in freight. A case 38 in. long by 26 in. wide should carry 1,200 to 1,500 seeds, to grow on the voyage, or 100 to 150 plants at a year old; whilst 50° F. to 55° F. is given as the lowest temperature *en voyage* that the seeds or plants can be expected to safely pass through. Having known Mr. Hart since 1890, when we first met him at the Botanic Gardens in Trinidad, and cacao being our favourite study, were he still with us we should like to have discussed at length many important points aised in this book, but now that cannot be.

"Tropical Life" Friend.—No. 77.

HON. MILES STANIFORTH SMITH.

Administrator of the Territory of Papua.

THE economic development of Papua during the last two or three years has been the subject of much discussion and many congratulations among those interested in the prosperity of our Australian Colonies, who are anxious to make a start in planting up the fertile tropical territory to the north of the continent, as they realize that once this is done the wealth of Australia will increase and be assured, as that of Malaya and the Straits was when the rubber industry became firmly established there. So long as a small section of Australians keep up the mistaken cry of "Australia for the Australians," using that to keep out any important influx of immigrants, that continent can never go ahead. In Papua, fortunately, Nature is not so narrow-minded as the civilized community "down south." There are, it is estimated, at least 500,000 natives in the British section, and this may be much less than the actual number, as a considerable area of the hinterland still remains unexplored; this Mr. Staniforth Smith knows, since he nearly lost his life trying to probe the mysteries of the little-known interior. Seated in a London office, especially one connected with the Press, you are inclined, when reading about Papua, to thank Providence that there are still a few square miles left where you can move about without fear of being knocked down by motors, bicycles, or by human beings anxious to catch their train or to be in time for a rubber board meeting. "Our Friend," when lost in the forests of New Guinea, whilst possibly agreeing with our opinion of London, would have preferred the risk of the motors and the hustle of the London crowd to the overdose of wild nature which he encountered in the forests. As a change is good for us, we are glad to hear that Mr. Smith is due home shortly, and may even be in London whilst we are printing this off.

The Hon. Staniforth Smith is an Australian born and bred, but has travelled extensively and made a careful and exhaustive study of tropical agriculture and economics. Born at Kingston, Victoria, in February, 1869, he was educated at St. Arnaud Grammar School and privately, and then proceeded to Melbourne University, where he paid special attention to engineering. The year 1896 found him settled in Western Australia. In 1900-1901 he was Mayor of Kalgoorlie, and took a leading part in the federal movement. As a result of the prominence this gave him, out of sixteen candidates he was returned, in 1901, by a large majority, at the head of the poll in the elections for the Senate. Between the year 1901 and 1907 he travelled extensively and made, as already stated, a systematic study of the government, agriculture, and general development of those centres which had come to the front as producers of tropical crops on a large scale under scientific management. To do this "Our Friend" visited both the English and German territories in Papua, and elsewhere in the Pacific, then proceeded to Java, Ceylon, the Straits Settlements, and Malaya, returning from there full of experience and new ideas for developing tropical Australia on similar lines. There is no doubt that the exhaustive knowledge Mr. Staniforth Smith acquired by these journeys was the cause of his being chosen in 1907 to assume control of the Development Policy of the Territory of Papua, his offices including the Commissionership of Lands and Survey, whilst he is also Director of Agriculture, Mines, and Public Works, with his administrative offices at Port Moresby. On his return to Australia from the tropical trip, Mr. Smith submitted a report to the Federal Government on "The System of Government, Administration, and Economic Development in the Federated Malay States and Java." This was published and issued as a Blue Book. In 1908 "Our Friend" was appointed Administrator of the Territory of Papua, a position which he still holds with considerable advantage to the Federal Government and those trading with this little-known portion of the British possessions, which has developed considerably under Mr. Staniforth Smith's able and tactful rule. In 1909, for the benefit of those anxious to obtain reliable and up-to-date information concerning Papua, "Our Friend" published through the Government printer at Melbourne a Handbook of Papua, running into some 170 pages, with many illustrations, and costing only eighteenpence. This useful book has run into several editions, showing what a demand there is for such a work. With Mr. Smith we say "*Floreat Papua.*"

Business Notices.

1.—The address of Tropical Life is Messrs. Bale, Sons and Danielsson, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All **literary communications** should be addressed **to the Editor,** and accompanied by the necessary stamps for their return if not accepted.

3.—All **business communications and payments**, either for subscriptions or advertisements, should be sent **to the Publishers** of Tropical Life. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is **Ten Shillings** per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed to the Manager of the Department.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

November, 1911.

Small Grocers and the Tea Trade.

The Tea and Coffee Trade Journal, of New York, for October, includes two articles on tea that are worthy of careful consideration on the part of those interested in this most necessary tropical product. In discussing "The Future of British-grown Tea," the journal's London correspondent shows an exhaustive knowledge of the complicated subject of which he treats, and in no part of the article is this more apparent than when discussing the "disposition shown by Australian merchants, who were accustomed to draw nearly the whole of their supplies from Colombo and Calcutta, to buy more from Java." This is proved by the figures given, which show that out of 24,604,466 lb. of tea exported by Java in the seven months ending July 31st, 1910, 656,546 lb. only went to Australia; during the same seven months this year nearly five times the quantity, or 3,128,459 lb., was shipped there. Concurrently with Australia's heavy purchases in Java, her operations in Colombo and Calcutta at present show an equivalent shrinkage of about 2,500,000 lb.

The second article is by an Irishman, or at least by a wide-awake Irish grocer; wide-awake from his appearance, as his portrait is included, as well as from the way he points out the breakers over which so many grocers have been crippled and wrecked, and seem likely to continue to be until they learn that a grocer's training consists of something more than being polite to good customers, indifferent to others, and an ability to do up packets of sugar, starch, &c., and check them in a loud and important voice as they pass out into the delivery vans.

Discussing with a whisky distiller the other day, the proposal of the Liverpool licensing committee to curtail the hours during which licensed premises, including clubs, shall be opened, he claimed that the proposal to prevent women from being served before 12 noon would only increase the trade of the grocers licensed to sell whisky, who buy "for price," and will, so he maintained, take anything that is given them so long as it shows a profit. Allowing for trade exaggeration, this statement is often true of grocers, and is certainly so to a far greater degree than should be if the public are to get good value for their money, and the small grocer is to maintain his own in the fight against the big stores. One has only to complain to the counterman, or the owner or manager of such a shop, about the quality or age of the goods sold, to realize the utter ignorance of many grocers as to where their goods come from, their life-history, the points constituting quality, &c., &c. If whole spices cannot be adulterated like ground ones, they are often so old and dried up that they have no flavour or goodness left. These are facts we can vouch for, and though we cannot speak so decisively of tea and coffee, we honestly believe that the enormous popularity of packet teas is entirely due to the public realizing that they get far better value by trusting to the packers and wholesale houses than to the local grocer, and the grocer should feel ashamed that it is so. If he took the trouble to study tea for a year or two at the start, and his other goods as well, he would soon find his knowledge increases quite enough to enable him (probably still serving under another man) to choose and mix the tea his employers are selling and to do so as an expert, by the time he came to set up for himself. Much spade-work in this direction has already been done by the Institute of Certificated Grocers, and by lectures delivered at large distributing centres by Mr. Duchesne and others. Superior persons affect to sneer at the efforts of the Institute, but those who are really cognizant of the need of reform and of the work being carried on to bring this about, are not at all inclined to join in any depreciation of the serious efforts now being made to educate the young grocer to a knowledge of the commodities he handles and of the most efficient methods of conducting his business. Of course no grocer's assistant has leisure sufficient to be a whole-time scholar at a technical institute, and therefore evening classes alone are practicable. These have been established at centres all over the country, and are worked in conjunction with the various county and borough education authorities. Information is imparted regarding commodities and their origin, manufacture, properties, handling, and value. Practical work is done, and such subjects as book-keeping and business management are dealt with in a competent way. Mr. A. E. Duchesne, who handles Indian tea, is one of the best known lecturers, and his lectures always arouse interest and enthusiasm. The fine lantern views with which he illustrates his descriptions of the planting and preparation of Indian teas bring home to the students the various aspects of Indian life and the details of manufacture in a way no mere course of reading could do. His lectures have been printed, and are much in request, a second edition having just been called for. There are many other competent experts who are helping with lectures and demon-

strations, and if the young grocer avails himself systematically of the instruction now within his reach, he should be well equipped to hold his own against the large packet houses, to the benefit both of himself and the public whom he serves. The present method of selling blended packet teas to "the million" at 1s. 4d. and 1s. 6d. lb. suits the producer, or rather the producer's agents, as it facilitates the disposal of the shipments to a few very large buyers, who mostly buy "for price," rather than to several thousand wholesale grocers or very large retailers who would otherwise be buying all grades with which to supply their customers. Present prices of tea are very satisfactory; at the moment supplies (as we showed in an article by V. Brown Paterson, one of the best Indo-Ceylon tea correspondents in London, and published in our issue of August, 1910) tend to rather lag behind, and with everyone running after rubber, the shrinkage may continue; therefore one might ask, Why worry? There are no reasons to worry, except two, and these are: (1) If the present state of affairs continues to increase (it will not go back, and therefore, as nothing remains stagnant for long, that means it will increase), the tea planters may find that the few very large buyers left to dominate the market will combine to lower values, and if they do so, and get the shippers well under their thumb, prices would seldom go up to the present level again. On the other hand, such tactics have already been tried this year with so little success that the promoters, who comprised several of the largest buyers, a few weeks ago abandoned the scheme, and went back to the old methods of individual bidding, and it must candidly be admitted that the history of the tea market during recent months does not forecast much trouble in the shape of future boycotts by the buyers. At the same time the matter deserves mention. (2) The grocers, who, we believe, hold an easy record as first in the list of bankruptcies, will find their lot goes from bad to worse, unless they pull up and really learn a little about the goods they sell, whether it be tea or coffee, nutmegs or cloves, sugar or cocoa. We have always tried to buy from individual grocers, instead of the large stores, but although the retailers are more attentive, and willing to oblige, although you feel they do their best to help you, the goods they supply are so indifferent and unreliable that you find yourself compelled to go to the big establishments, where men are curt and always in a hurry, and quite equal to passing off inferior articles on you if you give them a chance, but who do sell reliable goods if you go to first-class firms. To do that, however, we must pay first-class prices, and 90 per cent. of the British public cannot afford this; there is, therefore, really no reason why the individual small grocer should not remain with us and do well, if he will only study his business and learn to trust his own judgment, and not take what is given him by his wholesale suppliers.

Tea and Cover Crops.

MR. N. W. DAVIES, as Chairman of the first annual meeting of the Welimade Tea Company (Ceylon), told those present that "this had been a very bad year for drought, which caused the young tea plants, under a year old, to die back to the ground; with the rain, however, they came on again, as if they had been collar-pruned. This year we have had an almost phenomenal drought, but this Company had not suffered from it." Their escape seems to have been due to the following reasons: "We knew," continued Mr. Davies,* "that wind was bad, and from the beginning, when we planted tea, we planted *Crotalaria*, *Tephrosia candida*, *Acacia decurrens*, *Cajanus indicus*, and other *leguminosæ*. They grow magnificently, and we found that the cover crops not only protect the tea from the wind, but from wind wash as well. Again, wherever we had bare patches, we suffered almost as much from rain-wash as from wind-wash. The crops also do splendid work as green manure, and where the *leguminosæ* is thickest the tea was best."

Mr. Charles Grenier returns Home.

Grenier's Rubber News promises us great things in their coming Christmas Annual. From what their senior told us when in London, we believe that those responsible for compiling the number will be found, when the annual appears, to have kept their promise, with a margin to spare on the right side.

"I never felt better in my life," Mr. Grenier senior told the editor of *Grenier's Rubber News*, on alighting at Kuala Lumpur Station, on September 28th. "Whilst in London I veritably lived in a rubber world. Thanks to Mr. Staines Manders, I was admitted into the *arcana* of the exhibition world. My thanks are also due to the friendly attitude of the editors of the leading rubber journals in London. The silver-tongued Salmon (of the *Rubber World*); Mr. Tinnock, of the *Investor's Chronicle*, who has his finger on the pulse of the share market; Shephard, the mathematician of the rubber industry; Hunter, the *Financier's* prophet; Hamel Smith, the Editor of TROPICAL LIFE, who has wonderfully grasped the intricacies of the labour question. These are some of the names to conjure with in rubber circles at home."

Fishing Enterprises in the Tropics.

REFERRING to our article in the September issue, bearing the above title, and also to our reference on page 199 in last month's number to the possibilities of a fish-curing industry on the Gold Coast, the *Madras Mail* has had some good leading articles on the Madras fisheries. In the last instance they based their remarks upon the report of the Honorary Director of Fisheries at Madras, Sir Frederick Nicholson.

Our Madras contemporary practically confined their remarks to "noticing the remarkable possibilities of the fish-oil and guano industry, as revealed by the successful experiments at Cannamore. These experiments are the more valuable because they were conducted with a view to demonstrating the commercial prospects of the business." Instead of wasting the oil, and also the nitrogen, in the fish by drying them in the open, as has hitherto been done, by adopting a new process, it is estimated that on every 50,000 tons of fish dried, 10 lakhs of rupees, at a low esti-

* See the *Weekly Times of Ceylon*, October 10th, 1911.

mate, are lost in oil, and 2 lakhs in nitrogenous elements.

The new method, the *Madras Mail* tells us, by which such a saving can be effected is as follows:—The fish are boiled in open pans over a fire and the boiling stuff is pressed for oil; the pressed scrap is then dried in the sun on mats, and forms guano.* The price obtained for the oil is about Rs. 160 (£10 15s.) a ton of 250 gallons. A much higher price can be obtained for finer oil, but for the present Sir Frederick Nicholson does not recommend the adoption of means for producing the refined yellow oil, as the production of the inferior brown oil is very simple and highly remunerative. Where whole fish are used (sardines are the only ones mentioned, but there maybe, and doubtless are, others), the cost of turning 10 tons into oil and guano is about Rs. 160, and the yield is 1½ tons of oil (worth, as shown above, Rs. 240, or about £16), and 2 tons of guano (worth, at Rs. 70 a ton, Rs. 140, or about £9 10s.) A profit, therefore, of Rs. 220 on an expenditure of Rs. 160 is obtained, and a very good profit too, which our friends in Brazil, the West Indies, on the Gold Coast, and elsewhere where private individuals wish to place the fishing on an organized basis, will do well to note. The report (Sir Frederick Nicholson's) warns those studying it that in Madras at least this class of work can only be carried on by small factories as the fish shoals are very mobile, and in the Tropics the fish cannot be brought from a distance. This we would imagine could be overcome by the use of steam trawlers, and discharging the fish into tanks or holds filled or partly filled with water, until they can arrive into port. If this is not done, small quantities of fish oil and guano, especially if the supply is spasmodic and unreliable, would realize much lower prices than would be the case were substantial quantities to be forthcoming for certain. Madras will no doubt persevere in her studies of these industries, and other centres would do well to try and secure copies of Sir Frederick Nicholson's able report, which is highly spoken of by the Indian Government, as from all accounts it thoroughly deserves to be, and having secured a copy to carefully study it and turn it to account under their local conditions.

Referring to the foot-note, *re* using vacuum dryers for converting fish or fish offal into guano, Mr. Livingston, who is a leading expert in this, tells us that the method employed in at least one case is as follows: The fresh offal on delivery is emptied into a pit, from which it is lifted by a bucket conveyer and delivered into a cylindrical vessel in which it is cooked for a short time by steam under pressure. This cooking loosens the flesh from the bones, and also makes the latter brittle and more easily broken up. A door at the bottom of the cooking vessel is now opened, and the cooked fish is discharged on to a table, from which an attendant rakes it gradually into a crusher, which breaks up the large pieces. From the crusher it falls into a disintegrator, and leaves that in the form of a thin paste or semi-liquid pulp, which is conveyed by atmospheric pressure into the upper part of an air-tight casing within which a high vacuum is maintained, and which has steam-heated drums revolving towards each other, squeezing the fish pulp against their hot surfaces so that the revolving drums are continually being coated with the fish paste, and the moisture is most rapidly evaporated, although owing to the vacuum, its boiling temperature is only 100 to 110° F. When it has made about two-thirds of a revolution, the partially dried fish is removed by scrapers and taken by conveyer to a steam-jacketed cylinder having an internal steam-heated revolving tube with beaters, in which the drying process is completed, and the material automatically discharges itself as finished guano. From the time the wet pulp enters the drying apparatus until it is delivered as dried guano, it has been in a vacuum and hermetically sealed from contact with the air, and not the slightest nuisance can nor does arise. The cooking of the fish under steam pressure kills all germs and sterilizes it, and as it at once passes to the vacuum-drying apparatus, and does not again come into contact with the air and possible germs, until it has been thoroughly dried, the keeping properties of the vacuum-dried guano are exceptionally good. As the temperature of the fish during drying is only from 100 to 110°, or at the most 115° F., it is found that the ammonia and other constituents of value as manure are retained to a greater extent than is possible when the fish is subjected to a much higher temperature for a long time, as would be the case if a vacuum dryer was not used. From the time the attendant rakes the fish into the crusher until it is discharged as dried guano, the machines work automatically and continuously, so that much labour is dispensed with. If fresh fish be used the dried product can be milled and, as fish meal, be used for cattle food, a much higher price being obtained for it as such than for guano; but even as guano this by-product is of considerable value.

* A much better way would be to adopt vacuum dryers, as some friends of ours do at Grimsby and other large fishing centres, as such a system is quicker, cleaner, and far more healthy and pleasant to those living in the neighbourhood. These dryers have been most satisfactory even when dealing with offal, consisting of the heads, tails, and entrails of such fish as cod, haddocks, herings, &c., containing from 75 to 80 per cent. of moisture, all of which practically has to be removed in order to convert the offal into guano. A Passburg vacuum drying plant was supplied to some continental works for drying fish for human food. The same firm are drying the extracted liver paste on a Passburg double drum.

Indentured Labour in Tropical Colonies.

By The Editor.

On the invitation of Mr. Charles Grenier, I again have had the pleasure of contributing an article to *Grenier's Annual*. The same as with the paper I read before the Rubber Congress, I have confined my remarks to the question of "Labour in the Tropics," and as one is allowed to look rather more ahead in Christmas annuals, I have prophesied a time, and it will not be a far distant one, when the authorities in certain overpopulated localities will have to force the surplus population to migrate elsewhere, where their services are wanted, often badly wanted, instead of stopping at home to half or wholly starve themselves, whilst making others do the same, or at least rendering their struggle for existence needlessly harsh and difficult. The same as year by year our lives—according to some folk—are made more miserable and our pockets increasingly lightened by

sanitary, medical, and other boards, to force us to keep well, so will the public have to be persuaded in the same way to be kept from starving, and if this cannot be done by any other means, emigration on a large scale will have to be resorted to. If a man or woman in a congested neighbourhood is unfortunate enough to contract scarlet fever or small-pox, we do not sit by and commiserate with them or the family on their trouble; on the contrary, we often add to the worry and anxiety by taking the patient away and keeping him or her completely isolated, for the good of themselves and the public, until they get well, or the other thing. Small-pox is not pleasant, but small-pox is surely preferable to starvation or chronic want; if, therefore, we can forcibly remove patients for treatment until they get cured or die, how much more is it our duty to remove them when they are sickening and dying from want in one centre, whilst elsewhere others feel equally sick in another way, for want of the labour, that these starving people could well provide if forced to do so, the force being necessary only (as when isolating for small-pox) in inducing them to emigrate, not because they want to, but for their own and the public good.

Although, I believe, I have had the pamphlet for some time, it was only after writing these two papers that I studied the reprint of the speech on "Coolie Emigration," delivered by Lieutenant-Colonel Wyllie, F.R.G.S., at a meeting held in London, which was attended by such opponents to Colonel Wyllie's well-known views on labour questions as Mr. Noel Buxton, M.P., and Mr. H. W. Nevinson. Mr. Morel, of the *African Mail*, was also to have been present, but was unavoidably prevented from attending. He made a speech, however, by proxy.

Whatever view one may take of Colonel Wyllie's opinion on labour questions, no one will deny that after over thirty good and useful years' work in the Government's service in India, his opinion is worthy of careful consideration, and as he has arrived at the same opinion as myself, on the point of forcing the native to emigrate rather than to leave him alone to starve, I will quote what he said on this subject, viz., "Indentured Labour in Tropical Colonies." "What concerns us," he points out, "is that branch of famine-relief which invites the native of India to migrate to lands where his fecundity will prove a boon and not a source of anxiety to his rulers. It is curious that while the Government of India has persistently exerted itself to improve internal food resources it should have handled the cognate problem of emigration with a caution verging upon the timorous." That Colonel Wylie does not mean by this that the coolie is to be sent wherever he is wanted, whether he is well and fairly treated in his new home or not, is shown by his remarks on the Natal scandal. "His (the coolie's) treatment in the latter country (South Africa) appals me; I cannot conceive the remotest justification for it. . . . I do not for a moment claim that conditions in the latter (*i.e.*, West Indian Island of Trinidad) are perfect . . . but even there the abuses are neither incurable nor, I would submit, do they justify the wholesale condemnation of the system of indentured labour. . . . I have read . . . . that the Indian peasant will not emigrate except when at his wits' end—through family dissensions or the lack of means of livelihood.* Assuming this to be the bare truth (it is not universally true), how does it differ from the case of the European emigrant?" Here, therefore, is an official who, after thirty years of experience in India, has arrived at practically the same opinion as myself. I have never been to India, but I have known the West Indian Island of Trinidad, to which he refers, personally for over twenty years, and studied, and been really interested in the vexed question of cheap imported labour there for longer than that. If, therefore, this West Indian Isle can make such profitable use of coolie immigrants, both to the immigrant and to the planter, what will it be to Malaya, and elsewhere (where the coolies are well treated and housed)? Think of their lot in the new homes in contrast to starving in India. To my mind there need be no thinking about it. In a very short period we shall realize that it is our duty not to let them starve—the same as one day the school authorities, and the caretakers of "nobody's children" in England, will realize that it is their duty to train their charges for an agricultural and a colonial outdoor life in preference to be cooped up in a "hole of a city"—even in "Old England."†

"The Malay Mail" and a Tropical Agricultural College.‡

WE are pleased to see that Professor Dunstan's idea of establishing an Agricultural College in the Tropics, on which we built up our leading article in last January's issue, has again come to the fore, this time in the columns of *The Malay Mail*. In its issue of September 28th our contemporary referred to a July issue of *The Financier* of London, in which that paper discussed the need of the better training of planters and the possibility of successfully founding a tropical agricultural college, at which students could specialize in agricultural methods in vogue on tropical estates, after a course of training on soils, their cultivation and management generally, at one of the agricultural colleges at home. Following on the leading article in *The Malay Mail*, a Negri Sembilan correspondent to that paper, writing under the

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* They will not always do so then.—(H. H. S.).

† On this point it is only fair to state that several bodies have made a move in the right direction. Among these I can instance the Borstal system with young prisoners. Mr. Barker, now head of Dr. Barnardo's Home, has established a boys' colony, the Salvation Army has long had one. A Boy Scouts' Farm has lately been formed at Wadhurst, and Lady Meath presided the other day (October 11th) at a meeting, when various proposals were discussed to assist children to emigrate. All these I welcome, but still cry for more. At least 20,000 boys and young men should be induced to take up agricultural pursuits over-seas, in the Tropics, as well as elsewhere (if they treat the Tropics well the Tropics will treat them well in return), and until this is done I for one shall not feel that we are doing our duty to the children either of the rising generation or of those to follow after.

‡ See TROPICAL LIFE for January, 1911 (p. 11), and also Professor Wyndham Dunstan's Introduction to our last book, "Notes on Soil and Plant Sanitation on Cacao and Rubber Estates."

nom de plume "Darien," expressed his pleasure at seeing the matter brought forward, as he considered the fact "that some such institution for imparting this knowledge (*i.e.*, the technical training of would-be planters) is necessary, is becoming more and more evident every day, more especially now that rubber-planting has settled down into a steady industry." A thorough grasp of all the details connected with the management of an estate would, "Darien" considers, and very rightly considers, enable the planter to reduce the cost of production both in the field, in the factory, and last but not least in the estate office and the capable control of the books. If the idea of forming a Tropical Agricultural College should not be taken up soon, "Darien" suggests as a counter-proposal that an "Institute of Tropical Planters" be formed, with headquarters in London, and branches in the Federated Malay States and Ceylon, with three grades of members, viz., students, associates, and full members. The last named to be eligible must have had at least three to five years' experience as associates. The institute would issue a bulletin, and prizes could be offered for papers on technical subjects, &c., meanwhile the student members would be helped to get into the proper groove to learn their work, and assisted to secure places on estates abroad to obtain the necessary practical knowledge as well.

Rubber Share Market.

Messrs. Zorn and Leigh-Hunt reported that there was a very much more cheerful tone in the Rubber Share Market during the week ending November 11th, and a fair amount of buying was then going on. The liquidation of weak positions, which was the principal cause of the severe falls experienced towards the end of last week, has now apparently come to an end, and the satisfactory nature of the annual reports which follow each other at short intervals naturally leads those investors who have any money to spare to pick up good-class shares at the low figures now ruling. Unfortunately there are plenty of people at present who, while possessing with regard to the rubber planting industry the faith born of knowledge, are unable to make purchases because their funds are already completely locked up. The public at large, lacking any special knowledge of the general position of affairs and of the improving outlook for the commodity, have naturally been made exceedingly nervous by the long-continued downward course of quotations, and consequently a lot of small selling orders have been pressed upon the market, which have served to prolong and increase the recent weakness. As mentioned above, however, there is now a decided change in the feeling of the market, and with an improving tendency in the price of the raw material, a much more confident tone is making itself manifest. Most of the active shares show a considerable recovery from the lowest prices touched last week. The excellent output figures for the month of October, showing as they do that the effects of the long drought have passed away, have exercised a stimulating influence upon the share market.

Well washed and carefully assorted white Calcutta pigs' bristles sold as high as 30s. per lb. in London on October 16th.

Short Notices.

[*The fact that a book may be noticed under this heading does not preclude a review of the same volume appearing in a subsequent issue. Any book mentioned may be obtained from* Tropical Life *Publishing Department on payment of the published price, plus cost of postage.*]

From Messrs. Macmillan and Co. we have received a well-written and sumptuously illustrated volume on "The Geography and Geology of Northern Nigeria," by J. D. Falconer, M.A., who, owing to the fact that he was the Chief Officer of a Mineral Survey of the Protectorate, is well qualified to speak with authority on the subject he treats. The physical geography is first dealt with, and then, strata by strata, the geology, this latter being accorded the bulk of the space in the volume. Two appendices and a list of authors follow, the book being exceedingly well indexed and complete. The information contained in this book is wonderfully comprehensive, and its price (10s. net) gives no true idea of its value.

Unfortunately, as Major Basu, I.M.S. (retired), tells us in "The Dietetic Treatment of Diabetes," with special reference to India, diabetes is a common disease among the educated community in India, and it is more prevalent elsewhere than we care to think. Those, therefore, interested in the matter will be glad to run through this treatise of just forty pages, and note *what* foods to avoid and *what* to favour, as well as other treatment to be followed. Soya-meal and soya-meal bread is recommended. It seems that the Japanese use this food extensively. The book is published by the Panini Office, 40, Bahadurganj, Allahabad, India. Price, R. 1.80.

The "Rubber Planter's Notebook," by Frank Braham, F.R.G.S., is a handy little book of reference for those about starting rubber planting. It can easily go into the pocket, and will undoubtedly be found useful to jog the memory of those inclined to forget their first rules of planting and tree culture. All sides are touched upon—clearing, planting, tapping, and the machinery necessary—the whole concluding with some pages of hints on the maintenance of one's health in the Tropics. Messrs. Crosby Lockwood and Son, 7, Stationers' Hall Court, publish the volume, which contains 108 pp. and many illustrations, at 2s. 6d. net.

In answer to inquiries, "The Rubber Industry," being the official report of the Rubber Congress, held in connection with the London Rubber Exhibition last July, and published by the International Rubber Exhibition, Limited, will be issued to subscribers and the public as near to November 22nd as possible, or much about the same time as this number will be received by our home readers. Those requiring copies, therefore, of what will undoubtedly be the most important work yet published treating with all sides of the rubber industry, should send in their orders without delay, accompanied by the necessary remittance, *i.e.*, 16s. 6d. for delivery at home, or 17s. abroad, to our Publishing Department, 83-91, Great Titchfield Street, Oxford Street, London, W. The book will contain over 500 pages, we understand, and carry many illustrations of interest to planters and others.

Cotton.

THE following were the prices for Cotton in London on November 9th, according to Messrs. Slann and Davies:—

	Good Fair.	Good.	Fine.	Superfine.	Compare Good 1910.	Compare Good 1909.	
	d. d.	d. d.	d. d.	d.	d. d.	d. d.	
Surat kinds* ...	$4\frac{1}{2}$ to $4\frac{11}{16}$	$4\frac{3}{4}$ to $4\frac{15}{16}$	5 to $5\frac{3}{16}$	—	$6\frac{3}{4}$ to $7\frac{5}{16}$	$6\frac{1}{16}$ to $6\frac{7}{8}$	per lb.
Madras	$4\frac{13}{16}$ to $4\frac{15}{16}$	$4\frac{5}{8}$ to $5\frac{1}{4}$	—	—	$6\frac{7}{8}$ to $7\frac{9}{16}$	6 to $6\frac{7}{8}$	—
Bengal	—	$4\frac{5}{16}$	$4\frac{9}{16}$	$4\frac{11}{16}$	6	$5\frac{1}{2}$	—
Assam	—	$4\frac{5}{8}$	5	$5\frac{1}{2}$	$6\frac{1}{4}$	$5\frac{7}{8}$	—
China	—	$5\frac{1}{16}$	$5\frac{3}{8}$	$5\frac{5}{8}$	$6\frac{1}{4}$	$6\frac{1}{4}$	—
West Indian ...	$6\frac{1}{2}$	7	$7\frac{1}{2}$	$7\frac{3}{4}$	9	$7\frac{1}{2}$	—
Sea Island ...	$11\frac{1}{2}$	$13\frac{1}{2}$	$16\frac{1}{2}$	19	18	$11\frac{1}{2}$	—
West African ...	$4\frac{9}{16}$	$5\frac{3}{16}$	$5\frac{7}{16}$	—	$7\frac{7}{8}$	—	—
East ,, ...	$5\frac{1}{2}$	$6\frac{5}{16}$	$7\frac{15}{16}$	—	$8\frac{7}{8}$	—	—

* Liverpool quotations.

The "Spot" market during the past week (ending November 11th) has been quiet, with a reduction in the quotation for "Middling" from 5·17d. to 5·13d. "Futures" have not had one active day, and close practically at last Thursday's rates. The Cotton ginned to the evening of October 31st is returned as 9,968,000 bales, being 2,622,000 more than last season, and 1,776,000 ahead of 1908, the previous record year. Troubles in the Levant and the seriousness of the situation in China are telling adversely on Manchester trade. East Indian is at an entirely artificial price, and very little business is possible.

The import into Liverpool this week amounts to 207,527 bales, since September 1st 1,023,657, same week last year 168,291, last year's total 953,620 bales. The estimated Sales amount to 53,000 bales, including "called." Middling American is quoted at 5·13d. per lb., last year 7·92d., 1909, 7·77d.

Movement of American Cotton since September 1st:—

	1911-12.	1910-11.	1909-10.
Brought into sight	4,630,000	3,892,000	4,154,000
Exports from United States since September 1st—			
To Great Britain	1,136,000	1,020,000	832,000
To Continent, &c.	1,318,000	1,054,000	1,341,000
Total crop	—	12,120,000	10,610,000

The latest quotations of Americans for delivery, basis Middling, any port, G.O.C.:—

	November 9th. d.	Last Week. d.	Last Year. d.
November	4·98	... ... $4\cdot96\frac{1}{2}$	... ... $7\cdot75\frac{1}{2}$
Nov.—Dec.	4·89	... ... 4·90	... ... $7\cdot69\frac{1}{2}$
Dec.—Jan.	4·89	... ... 4·90	... ... $7\cdot69\frac{1}{2}$

Coffee.

By MESSRS. C. M. AND C. WOODHOUSE.

SINCE the beginning of November, the market has been quiet, but a rather better tone has been in evidence. Auctions have been on a very restricted scale; Colombian realized firm rates, and Unwashed Dumont Santos partly sold at and after the auctions at an advance of 1s. per cwt. According to Messrs. Düüring and Zoon the stocks in the principal ports of Europe on November 1st show an increase for the month of 140,000 bags, against an increase of 208,000 bags at the same time last year; the visible supplies show an increase of 739,000 bags, against an increase of 89,000 bags for the same period in 1910. The market for "futures" opened firm, but after some fluctuations closes weak at 62s. 4½d. per cwt. for March Santos. We quote:—

		To-day.	Nov. 2nd, 1911.	Nov. 12th, 1910.
London ..	Santos, Mar. del.	62s. $0\frac{1}{2}$d.	62s. 9d.	45s. $4\frac{1}{2}$d.
New York ..	No. 7 Rio ,,	13.60	13.62	9.05 cents.
Hamburg ..	Santos ,,	$68\frac{3}{4}$	$68\frac{1}{4}$	$49\frac{3}{4}$ pf.
Havre ..	Santos ,,	83	$83\frac{1}{2}$	$63\frac{1}{4}$ fcs.

The receipts at Rio and Santos from July 1st to November 8th, 1911, were 7,827,000 bags, against 7,167,000 and 10,473,000 bags in 1910 and 1909 respectively.

The stocks in the principal ports of Europe on November 1st were estimated at:—

1911.	1910.	1909.
6,335,000 bags ...	7,887,000 bags ...	8,406,000 bags

The visible supply of Coffee on November 1st was estimated at:—

1911.	1910.	1909.
13,122,000 bags ...	14,840,000 bags ..	17,519,000 bags

Sales include the following, viz.:—

Colombian, &c.—136 bags, at 78s. to 81s. 6d. for smalls, 84s. to 84s. 6d. for good middling, 88s. to 89s. for bold.

Dumont Santos.—2,400 bags, Unwashed at 71s. 6d. for smalls, 73s. 6d. for medium, and 75s. 6d. to 76s. for bold.

Sugar.

WRITING on November 9th, Mr. C. Czarnikow reported that the information received from leading Russian exporters three weeks ago, that Russia would only claim an extension of 8 million poods, was changed by others to 200,000 tons, thus bringing the total contingent up to 400,000 tons, but since then Sir Edward Grey stated that an increase of 400,000 tons (total contingent 600,000 tons) had been asked for, and that the delegates had agreed, provided Russia made satisfactory proposals for renewing the Conven-

tion. Leading circles in Russia declare that she will not prolong the Convention at 200,000 tons, and if the other Powers are just as determined not to sell some very valuable concessions for nothing, negotiations may not run as smoothly as nervous holders, on the strength of our Foreign Office declaration, expected. During the first fright May Beet declined from 17s. 1¾d. to 16s. 6d., but when the figure was serious questioned the market recovered to 17s., especially as factories, on basis of disappointing results, sent buying instead of selling orders. It really seems as if the fabricant had not been sufficiently despondent in issuing October estimates, and that figures may have to be reduced, in which case some increase of Russian might not affect us so much. During October we imported 50,000 tons more Javas and 9,500 tons more Russian. Part of these Javas came probably *via* India, in addition to what is entered from India, because our Customs still keep up the fiction of countries of consignment, instead of countries of production. Every grain of Sugar is known here according to its country of production, yet we might get Javas via Holland entered as Dutch Sugar, viz., Beet. It seems a pity that this is not altered, as each declaration is quite clear.

From Cane-producing countries there is nothing fresh to report.

The American market has given way in sympathy with the easier tone on this side, and the quotation for spot Centrifugals has relapsed to 5.15 cents = 16s. c.i.f. for 96 per cent. Javas. In the United Kingdom buyers of Cane Sugar have not shown much disposition to treat for refining grades, even at lower prices. Very little business has therefore been transacted. Grocery Crystallised is in small supply, and at auction sold at unchanged values. The total transactions of British West India for the week amount to only about 1,000 bags. Crystallised Demerara, fine yellow sold at 22s. 6d. to 23s., duty paid. Crystallised Trinidad, good yellow and palish 21s. 9d. to 22s. 1½d. Crystallised St. Lucia greyish brown 20s.

About 800 tons Madras Cane Jaggery, February—April shipment, changed hands at 12s. 4½d. ex ship, London.

The India-rubber Market.

According to Messrs. Lewis and Peat, at the sales held on October 31st and November 1st, 8,350 packages of Plantation were offered, comprising about 365 tons Straits, 78 tons Ceylon, and 3 tons Java, and all sold with good competition. At the opening a decline of 2d. on the good and 3d. on the darker grades were shown, but as the sale progressed prices hardened a little, except in the case of Unsmoked Sheet and Brown grades, which were very irregular. Prices throughout the sale kept very steady, and closed about 1½d. down on the average of last sale, making quotations work out as follows: Smoked sheet, 4s. 6¾d. to 4s. 8½d.; good to fine sheet and biscuits, 4s. 3¼d. to 4s. 7½d. Crêpe, fine blanket, 4s. 6½d. to 4s. 8¼d.; very pale, 4s. 6½d. to 4s. 8¼d.; medium and palish, 4s. 5¾d. to 4s. 7½d.; dark and brown, 4s. 1½d. to 4s. 6½d. Unwashed scrap, medium to fine, 3s. 10½d. to 4s.

Previous to the sales Hard fine has been done down to 4s. 3d. for spot, 4s. 2½d. for November-December, December-January, and January-February. We close with sellers at these prices and buyers at a little under. Soft fine, spot 4s., distant small sales at 3s. 11½d.; Buyers of January-February at 3s. 11d.; Negroheads, scrappy, 3s. 8d.; islands, 2s. 5½d.; Peruvian, 3s. 5d.; Mollendo, 3s. 2d.; Cametas, 2s. 6½d. values.

Peruvian.—Fine nominal at 4s. per lb. Ball, on the spot sellers ask 3s. 11d., distant positions 3s. 9d. sellers, buyers at 3s. 7d., 3s. 8d. per lb.

Medium Grades.—In fair demand, but only a small business has been done.

The following prices were realized on November 1st:—

Central American.—Dark brownish scrap, part heated, 3s. 4d.; uncured Castilloa biscuit, 3s. 3d.; good white Mexican block, 3s. 11¾d. to 4s. per lb.

Mozambique.—Good clean reddish ball, 3s. 10d. to 4s. 1¼d.; part good reddish ball mixed black nuggets, 3s. 9d.; reddish ball, mixed black nuggets, all rather barky, part heated, 2s. 11d. to 3s. 4d.; fairly clean spindles, few sandy, 4s.; dark and whitish ball, 3s. 6½d. to 3s. 7¼d.; pressed Mombasa pinky sheet, 3s. 4d.; pressed dark ball, part heated, 2s. 8d. to 2s. 9d.; washed crêpe, heated and stuck with paper, 2s. 1d. per lb.

Madagascar.—Fairly clean niggers, 2s. 8d. per lb.

Nyasaland.—Rather rough biscuit, 3s. 8d.; thin pale and palish sheet, 4s. 0½d.; brown crêpe, 3s. 8d. per lb.

Manihot.—Dark brown pressed crêpe, 3s. 5d. to 3s. 5¼d.; pressed whitish ball, rather soft, 3s.; good gristly crêpe, 4s. 0¼d. to 4s. 0½d. per lb.

Abyssinian.—Fairly clean thin and thick pressed sheet, 3s. 0¾d. to 3s. 1d. per lb.

Plantation Pará.—A considerable business done in 1912 crops from 4s. 6d. to 4s. 7½d. per lb. November-December latex done up to 4s. 9½d.; January/March and January/June up to 4s. 8½d. for crêpe. At the close prices are easier, with sellers at about a penny under the top rates.

Plantation Grown Pará.—At the sales held on November 14th and 15th 312 tons of Malay and 82 tons of Ceylon were offered, and all sold with fair competition. At the opening an advance of 2d. per lb. was shown on the average rates of last sale, but later prices declined ½d. to 1d. per lb., chiefly on the better grades. At the close, however, prices were firmer, and we finished at only a little below the opening rates. Crêpe: Fine blanket, 4s. 8½d. to 4s. 9¾d.; pale and palish, 4s. 8¾d. to 4s. 10½d.; light, 4s. 8½d. to 4s. 9¼d.; fair mottled, 4s. 8d. to 4s. 9¼d.; light brown, 4s. 8½d. to 4s. 9¼d.; brown, 4s. 5d. to 4s. 9d.; dark brown, 4s. 4d. to 4s. 8d.; dark, 4s. 4d. to 4s. 6½d.; black, 4s. 2½d. to 4s. 5d.; specky barky, 4s. 1¼d. to 4s. 6d.; smoked, 4s. 3¾d. to 4s. 9d. per lb. Biscuits and sheet: Smoked sheet, 4s. 7¾d. to 4s. 11½d.; fair, average 4s. 7½d. to 4s. 9½d.; off sheet, 4s. 5¼d. to 4s. 8¾d. per lb. Scrap: Fair, 3s. 11¼d. to 4s. 2¼d. per lb. Lanadron: Block, 4s. 10d. to 4s. 11½d. per lb. Ceara: Sheet, 4s. 5¼d. per lb. Castilloa: Good pressed whitish sheet, 4s. 2d.; good dark smoked sheet, 4s. 0¼d. per lb.

Latterly a better but fluctuating market. Fine hard has been done up to 4s. 6d. for spot, and near and more distant up to February/March at 4s. 5d.; after this prices declined, and business was done down to 4s. 4d. At the close, however, the market is steady, with buyers (all positions) at 4s. 4d. and sellers at 4s. 4½d. per lb. Soft fine done up to 4s. 1½d.; value to-day, 4s. 1d. per lb. Ball: Very little offering on the spot; nominal value, 3s. 10½d. November/December and December/January sellers at 3s. 10d. and buyers at 3s. 9d.; a small business was done at 3s. 9½d. per lb. Negroheads: Manaos scrappy, 3s. 9d.; Islands, 2s. 6d.; Peruvian, 3s. 6d. and Cameta 2s. 7d. values. Medium grades in fair demand, but only a small business doing.

Tea.

By MESSRS. WM., JAS. AND HY. THOMPSON.

A SMALLER OUTPUT INEVITABLE.—MORE CHINA TEA USED.

DURING the week ending November 11th, the usual monthly telegraphic information issued by the Indian Tea Association has been received in London, and it serves to confirm the advices we published on November 2nd. The report advises an adverse change in weather conditions in nearly all producing districts, but more particularly in Cachar, the Dooars, Darjeeling and the Terai, where prospects are "bad"; Assam and Sylhet being the only districts where prospects are apparently fair, although weather conditions there are reported to be more or less unfavourable to outturn. A considerable shrinkage in the increase previously estimated is therefore inevitable, and it may now be safely assumed that the surplus over last year's crop has already passed the markets. Any appreciable alteration from the existing position is mainly dependent upon the extent of Calcutta trade with outside markets between now and the close of the season; at the moment, less tea in the total has been absorbed by these demands, but in the case of Russia it is not unreasonable to expect that much of the decrease will eventually be recovered; at the same time allowance must be made for restricted buying on Hankow account. In anticipating probable supply, the Indian export figures up to end of October require some explanation, as the increase now stands at only 4½ million lbs., having apparently gone back some 6 million lbs. during the second half of the month. This is attributable to temporary shortage of freight in Calcutta due to the detention of steamers on this side during the August labour trouble, and it is borne out by the fact that between the 3rd and 9th of last month no tea whatever left Calcutta for London, and in the ensuing week only three home steamers left with tea on board. The deficiency will probably be reflected in freer shipments during November. From Travancore the latest figures show a decrease of over a million lbs. in exports; while from Ceylon the month's shipments are about 1½ million lbs. ahead, and the estimate for the current month provides for a further increase.

The most noticeable features in the Board of Trade figures are: That appreciable increases in China tea are shown in all positions, suggesting a freer use of this growth; that a substantial increase of 2 millions is shown in the month's Indian deliveries, which are indicative of trade precautions in view of possible labour unrest, and that stocks of all tea mark the same deficiency as shown last month, *viz.*, 6¾ million lbs. The ratio of increase between deliveries and imports is not disturbed, and the five months' returns show that the former are still progressing at a greater rate than the latter.

TOTAL DELIVERY IN UNITED KINGDOM, 5 MONTHS, JUNE—OCTOBER.

	1911.	1910.	1909.
Indian	75,852,400	72,006.600	55,566,000 lb.
Ceylon	49,765,700	50,367,200	49,986,800 ,,
China	10,576,400	8,172,500	7,349,200 ,,
Java and other Countries ...	10,554,700	9,674,600	8,693,200 ,,
	146,749,200	140,220,900	121,595,200 ,,

The market continues to be liberally supplied, and sales have again been heavy, but they were readily absorbed without inconvenience and the tone has continued buoyant throughout in respect of both Indian and Ceylons, while Javas have also shared in the active demand. Prices have again ruled fully steady to dearer, common tea has shown a fractional advance and Ceylons of this denomination have now touched 8½ per lb., very few quotations below this having been recorded in any growth. The quality of Indians, moreover, has not been fully equal to the previous week, but Ceylons have as a rule fairly maintained their attractive standard.

The Indian teas sold during the week were of a good useful standard quality, the general tendency, however, being towards less desirable tea, more especially from Assam and Darjeeling. The market may be quoted strong, to sometimes dearer, with a keen demand for tea between 8½d. and 9½d. per lb., for which advances of ¼d. per lb. were occasionally paid. This movement was, perhaps, more noticeable in the case of Dooars tea. Fair common leaf is eagerly taken at 8⅛d. to 8¼d. per lb., only very inferior parcels being available below this figure. The highest averages from the various districts were: Darjeeling—Murmah, 1s. 2¼d.; Ting Ling, 1s. 0½d., and Goomtee, 11¾d. Assam—Beheating, 1s. 4¾d.; Rupai Co., and Kharjan, 1s. 1½d.; Suddia Road, E.A.T. Co., Balijan and Sepon, 1s. 0¼d. For the whole Sale on Estate Account the average price realized was 9½d. per lb., against 8½d. per lb. a year ago.

The Ceylon market must be quoted as strong all round; very active bidding for the medium grades being the most noticeable feature. Quality is somewhat irregular, but last prices have been beaten practically all along the line, and a comparison of last week's prices with this week's, where following invoices have been sold, will show an almost general rise of ¼d. per lb. Clean, usable black leaf tea was sold at 8½d., but was only in small supply. Pekoes and Orange Pekoes were well supported, and made the most decided advance, though medium to good medium brokens came in for very strong competition. Dusts and Fannings sold at rather firmer rates. The highest

averages were: Mount Vernon, 1s. 0½d.; Goatfell, 1s. 2¼d.; Diyanilakelle, 1s. 1d.; Henfold, 11¾d.; Kenmare, 11½d.; Ambawella, 11¼d.; St. Leonard's Fordyce, 11d. For the whole sale the average price realized was 9½d. per lb., against 8⅝d. per lb. last year. For next week, 25,105 pkgs. are in print.

There are no public sales of China to record. The quotation for common Monings is now 5¾d. per lb., at which price, however, available supplies are not too extensive. Among the higher grades a limited business has been transacted for immediate requirements.

The moderate offerings of Java met a very strong demand, and prices throughout may be quoted firm to rather dearer, especially among useful broken Pekoes, about 9d. to 9½d. per lb. The highest averages were: Malabar and Tanara, 9½d.; Pagilaran, 9¼d. For the whole sale on Garden Account the result was 8 4-5d. per lb, against 7¾d. per lb. a year ago.

At the sales in Amsterdam on the 3rd inst., the quality generally was fair average. There was a strong and active demand for all grades, and all leaf descriptions showed ½d. per lb. advance. Firmer prices were also obtained for Dusts and Common broken teas.

The London Cocoa Market.

By The Editor.

Valorization is still in the air, but London opinion on the whole insists that it has missed fire, and is "off." It is true that no official statement has been issued to show that it has been agreed to, but then, it can be claimed, neither is there any proof that the matter has been dropped or that an agreement between San Thomé and Bahia may not yet be arrived at. Strenuous efforts have been put forth to prevent the scheme being successful, and it has yet to be seen whether the Latin-American and his Portuguese cousin in Europe cannot be equally strenuous and persistent. Again, an idea prevails in London that the aim of some of the chief movers in the scheme is to make Lisbon a free port, against Havre, Hamburg or London, and having done so to "corner" cocoa (a very different matter to valorization pure and simple, as was understood by the Greek currant or the Brazilian coffee scheme). This "cornering" was to be done by laying up in Lisbon any surplus supplies which would, if placed on the market, tend to drive prices down below a remunerative level, as was the case in 1894 or 1895. This might, perhaps, necessitate as much as 1,000,000 bags of cocoa, perhaps, being stored up at a time, and even the proportions of the various growths that are to go to make up this amount have been mentioned. The Gold Coast was to provide 300,000 bags, San Thomé, San Domingo, Bahia and the West Indies 150,000 each, other centres 100,000. The *Economist* again had an article, this time a much longer one, on the matter, and in this article the question of laying up a million bags was also spoken of. All this is, of course, a horse of a very different colour, and if the idea is current, much less if there is any truth in the report, then nothing but the most strenuous opposition can be looked for, and certainly will be forthcoming.

Valorization, however, on similar lines to the Greek currant or Brazilian coffee schemes, to organize bumper crops when they come along at inopportune moments, would benefit large producers and manufacturers alike, as it would prevent prices dropping to 40s. or less, as they did sixteen or seventeen years ago. This caused a large number of small jobbing makers to spring up, untrammelled by well-known and widely advertised fixed prices as the large manufacturers were, and still are; and by selling at lower prices caused the large makers to lose the chance of a lifetime to make larger profits to counteract prices at 100s. to 120s., as they, the big makers, had to pay in 1906-7, whilst the jobbers had dropped out as soon as prices ran up to 50s. or more. Valorization, therefore, to prevent a repetition of this, should be acceptable to the manufacturers as well as to the planters.

Leaving, however, the "pro-Vals" and "anti-Vals" to fight the matter out between themselves, I must be getting on to more ordinary market gossip. Whilst prices at the moment are slightly below the highest, and although Bahias, "to arrive," are now being offered at 54s. or 55s., against 57s. 6d., as was the case at the end of October, the level of values is still good. Trinidad and all the West Indian centres seem likely to be late with their crops, so that Trinidads at any rate, at the time of going to press, was selling at 65s. to 66s. for good mid. to fine good red marks, and 67s. for superior. In spite of the very heavy receipts of Guayaquils, a fair business was done in this growth a little time back at prices as quoted later on. (60s. for good Caraquez, and 66s. for fine summer Arriba). Sales have not been held regularly as the supplies of second-grade cocoas, especially Grenadas, have become exhausted. Our stock has also fallen away. On November 4th it was down to 98,297 bags, the first time it has dropped out of six figures since February 4th. Meanwhile, the following consumption figures are of interest as they complete, except with America, the third quarter of the year:—

Delivered for Consumption:—

		1911.		1910.	
Germany	9 months	37,734		32,081	tons (English).
U.K.	,,	18,095		16,778	,, ,,
Holland	,,	18,514		14,567	,, ,,
France	,,	19,309		17,589	,, ,,
U.S.A.	8 months	48,230		36,021	,, ,,
	Comparative totals	141,882		117,036	,, ,,

Coming now to the United Kingdom alone, the Board of Trade returns for the ten months, January-October, show a further increase of 500 tons in the deliveries for Home consumption (2,454 tons against 1,943 in October, 1910), the full figures working out as under:—

Raw cocoa only—	Landed.	Del'd. H.C.	Export.	Stock (Oct. 31st)
Jan.-Oct., 1909—	29,098	20,048	5,357	8,613 tons
,, ,, 1910—	25,341	18,726	5,725	9,281 ,,
,, ,, 1911—	26,724	20,549	5,704	9,985 ,,
	Incr. 1,383	Incr. 1,823	Decr. 21	Incr. 704 ,,

Stocks in London and Havre, according to the latest figures available, run as follows:—

Havre Stock, October 31st—

	Landed. Bags.	Del'd. Bags.	Stock. 1911 Bags.	Value. Fcs.	Stock. 1910. Bags.	Value. Fcs.
Pará... ...	1,292	3,091	21,609	74 to 78	34,168	66 to 69
Bahia ...	2,354	3,936	17,912	70 ,, 78	26,429	61 ,, 68
Venezuela ...	3,333	3,949	56,626	71 ,, 200	56,858	65 ,, 170
Trinidad ...	500	4,480	41,437	75 ,, 79	53,049	67 ,, 70
Grenada and other W.I.	22	510	3,012	69 ,, 76	2,973	61 ,, 68
San Thomé...	1,849	3,627	15,620	74 ,, 76	8,750	65 ,, 66
San Domingo	206	3,051	8,945	66 ,, 71	9,642	59 ,, 62
Haiti ...	169	2,168	3,651	57 ,, 72	12,576	50 ,, 64
Accra ...	1,270	5,782	33,875	67 ,, 71	15,334	59 ,, 62
Guayaquil ...	1,728	1,886	14,903	71 ,, 80	9,313	67 ,, 82
Others ...	—	7,503	13,477	—	23,897	—
Total	12,723	39,983	231,067		252,989	
In 1910	18,105	38,315		In 1909	213,371	

London Stock, October 11th—	1911. Bags.		1910. Bags.
Trinidads	6,713	...	8,525
Grenadas	6,811	...	8,974
Other W.I.	5,498	...	3,843
British West Africa ...	2,757	...	2,662
Portuguese West Africa ...	2,300	...	1,441
German West Africa ...	6,014	...	1,057
Ceylon and Java	12,465	...	9,987
Guayaquil	43,068	...	33,951
Brazil and Bahia	340	...	978
Other Foreign	8,394	...	13,468
Totals ...	94,390		84,886

Deducting the stock of Guayaquils, we therefore had 51,322 bags on hand this year, against 50,935 bags in 1910.

Prices, according to the last business done and including the sales on November 14th, run as follows:—

Trinidads.—Mid. red sold at 63s., good to fine marks, 63s. to 67s.

Grenadas.—Common unfermented sold at 58s., but since the middle of October fine has been selling up to 62s. 6d.; good red, 60s. to 61s.

Dominicas.—Fine have been selling up to 61s. 6d., fair reddish down to 58s.

St. Lucia.—Good to fine marks 60s. to 62s.

Jamaica.—Supplies very small and crop late. Of the small lots offered, good reddish sold at 59s. 6d.

St. Vincent.—Good reddish sold at 58s., fiery red at 62s.

Venezuela sold at 64s. for unclayed Caracas, and 67s. for other kinds.

West Coast African sold in London at 45s. 6d. for low reddish, whilst good red is valued up to 56s. Up at Liverpool a fair business has been doing at 50s. to 55s. 6d.

German East African.—Good bold Tanga sold at 67s. 6d.

San Thomé and German Cameroons are valued 59s. to 61s.

Guayaquil.—Fair to fine Arriba has been selling at 61s. to 66s., good Caraquez at 59s. to 60s.

Ceylons.—Good to fine marks have been conspicuous by their absence, and nothing of this growth has been sold lately above 60s. to 65s. for fair medium estates, against this bold brownish Java realized 70s. to 74s.

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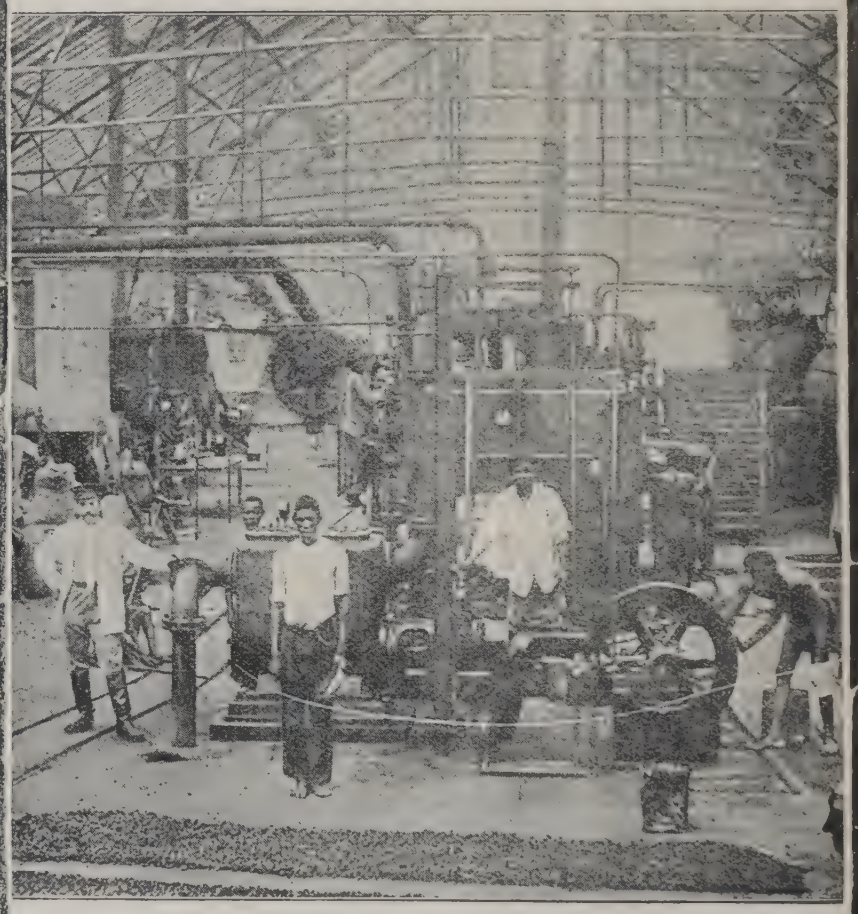

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Tropical Life:

A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

VOL. VII.—No. 12.] DECEMBER, 1911. [ANNUAL SUBS., 10/- / SINGLE COPIES, 1/- } POST FREE.

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"Tropical Life" Prize for the best Essay on the Fermentation of Cacao.

As already stated, we were compelled, out of fair play to all concerned, to postpone the final date for the reception of the essays on the above subject for twelve months, that is, until January 31st next (1912). Those who are arranging, therefore, to send in essays must despatch them at once, if they wish to be in time. The eighteen or twenty firms who have subscribed towards the prize regret that so far only two names have been sent in, and trust that at least a dozen essays will be received from those competent to write such a treatise as is asked for, as they are most anxious to obtain reliable information on the subject. The information given must be based on practical experience and not on theory, and unless the results are of scientific and practical value, and the points raised are answered in detail, no prize will be awarded; that is to say, a useless essay written by one unable to add to our knowledge on the subject will not gain the prize simply because no one sent in a better and really useful essay, the subscribers, however, will be only too willing to award the prize if the queries raised are properly answered.

The following gives full details of the subject on which the essay is to be written. Papers sent in, therefore, must be able to treat the matter from a scientific as well as from a practical point of view, as the main object is, as stated, to obtain exact particulars of the biological *as well as* the chemical changes that take place in the bean during the process of fermentation.

THE FERMENTATION AND DRYING OF THE CACAO OR COCOA BEAN (*Theobroma cacao*).

The essay should record precisely and in full detail the changes resulting from the processes of fermentation and drying that take place in the bean from maturity in the pod to the time of putting the cured beans into bags for market. Biological as well as chemical changes should be noted. The action of maximum, minimum and optimum temperatures, and of checks producing differences of times in the fermentation and drying processes should be noted for every stage. The differences due to such variations on the resultant cured bean should be clearly traced. The possibility should be discussed of producing at will by such variations, and independently of the natural character of the bean, varieties of taste and of colour, both internal and external, so as to simulate the different kinds of cocoa known on the market. Alterations that might be made in ordinary methods so as to improve the quality of the cocoa should be explained. Waste products should be considered, and their potential value indicated.

Cacao Cultivation.—No. XXIV.

POTASSIC MANURE FOR CACAO TREES.

MR. W. M. MALINS-SMITH, of Grenada, has favoured us with the following particulars of the experiments carried out by him regarding the use of potassic manures for cacao trees.

"My first experience of the value of sulphate of potash for cacao plantations was in the period 1901-4, when I worked some experiments on the following lines. A standard base of 8 cwt. of basic slag was worked in to each acre, and besides this, a few months later, we add the following:—

1½ cwt.	sulphate of ammonia	to No. 1 plot	per acre
1½ ,,	nitrate of soda	,, No. 2 ,,	
and 1 ,,	sulphate of potash	,, No. 3 ,,	

The results were an average yield of cacao from each plot during the period of three years of:—

No. 1 plot ...	8½	bags each	180 lb.	cacao per acre per an.
No. 2 plot ...	7¼	,,	,,	,, ,,
No. 3 plot ...	8¼	,,	,,	,, ,,

"Previous to the application of the manures, the field yielded an average of three bags per acre per annum. The crops given are an average of the years 1901-4. The quantities of the manures given were applied in 1900 and again in 1902.

"Similar experiments were conducted on several estates in this Island at the same time, and the potash plot came out top with all of them, although the yield was not in any case as big as in my plots. I regret that I am not able to give the figures for the other plots.

"In my latest manurial experiments I applied to one plot a complete combination of—

Basic slag	8 cwt.	per acre
Sulphate of ammonia	2 ,,	
and Sulphate of potash...	2 ,,	

but the results were not satisfactory. On another plot to which was applied—

Basic slag	4 cwt.
Sulphate of ammonia	2 ,,
and Lime (slaked)	1 ton

and no potash, I got emphatically negative results.

"The plot which gave me the best results was manured with a complete commercial fertilizer which contained, by analysis, 4.68 per cent. of potash, equal to 8.66 per cent. of sulphate of potash. This works out at 86 lb. of sulphate of potash per acre, which was in combination with—

Tricalcic phosphate	210 lb.	per acre
Ammonia	55 ,,	
Calcium oxide	170 ,,	

One application of this complete manure gave me three crops, totalling 25 bags of 180 lb. each, or an annual average of 8⅓ bags.

"My experience in manuring cacao leads me to believe that the best complete combination for this crop is—

Phosphates	20–25	per cent.
Ammonia	5	,,
Potash	5	,,
Calcium oxide	16	,,

"This can be made up into a manure that can be sold at a profit in Grenada at, say, $40.00 per ton. Grenada buys a comparatively large quantity of commercial fertilizers (more than 1,000 tons per annum).

"I propose starting other series of experiments, and shall be pleased to give you further particulars of the advantages of the use of fertilizers on a large scale on cacao estates."

In reference to this, it is interesting to note that Hart,* quoting Marcano, gives us the following particulars of an acre of cacao (containing 302 trees, we suppose), and the plant food removed with the crop:—

	1.	2.	3.
Nitrogen	201	15.5	8.7 lb.
Phosphoric anhydride ...	95	7.9	4.5 ,,
Potash	251	22.1	3.7 ,,
Lime	400	6.5	1.4 ,,
Magnesia...	111	2.3	1.0 ,,

No. 1 shows what an acre of trees contains of the above elements.

No. 2 shows what is abstracted from the above, if the entire fruit (husks and beans) is removed from the field.

No. 3 shows what an acre of trees will abstract if the beans only are removed.

From these figures, Mr. Hart argued, it appears that the cacao tree, whilst storing up in itself relatively large proportions of the important elements of plant food present in the soil requires for the yearly production of young shoots, leaves, and fruit, not less than 138 lb. of nitrogen, 64 lb. of phosphoric anhydride, 94 lb. of potash, 104 lb. of lime, and 31 lb. of magnesia per acre. Some of the above is given back to the soil by the decomposition of the fallen leaves, prunings, and husks. These must not, on any account, be left about, but buried sufficiently deep to prevent their becoming breeding centres for pests, and passing them on to the trees. As it is not always convenient to bury large quantities of such refuse regularly throughout the estate, consideration must be given to those trees that do not receive their share of such natural manures, and a supply of artificial manure applied to them to make up for such deficiencies.

IT is stated, says the *Brazilian Review* of October 31st, that the new Director of the famous Botanical Gardens of Rio will be Professor Willis, at present Director of the Botanical Gardens in Ceylon.

THE Rio de Janeiro Hotel Co., Ltd., has purchased the old Ajuda Convent, which stands at the Monroe Palace end of the magnificent Avenida Central in Rio City, and the old buildings are to be pulled down to give room, so the *Brazilian Review* reports, to what promises to be the finest hotel in South America. The curious old fountain known as the "Chafariz das saracuras," with its bronze birds and tortoises, has been presented to the Prefect of the Federal District, and will be set up at some prominent point in the City, whilst arrangements have still to be made to receive the remains of the relatives of Dom Pedro I and II, who were buried within the walls of the Convent.

---

* "Cacao," by J. Hinchley Hart.

Stump-clearing by Explosives.

Many, perhaps most, people only associate explosives with war, mining, rock-blasting, and occasional anarchist outrages; for a good many years, however, high-class explosives have been used with great success for clearing forest and other land of trees, stumps, boulders, rabbit warrens, ant-hills, &c., and on this account should specially appeal to those clearing land in the Tropics. In freshly opened areas it has the great advantage of breaking up the soil and so rendering it more easy to cultivate; on some hard soils its use can alone make it possible to secure profitable crops. Thanks to modern improvements in the blasting cartridges and the introduction of electric detonators for exploding the charge, this can be done without risk, and at very little expense and trouble. When removing the largest trees and stumps, after the necessary boring has been done, two or three holes only being required, the operation takes only a few minutes. The size of the tree is of no apparent consequence, it is only a matter of a hole more or less, a larger cartridge, or a stronger explosive; in other respects the methods employed and the labour involved are just the same. As regards the boring, this can be done in two ways:—

No. 1.—By boring into the earth immediately under the tree or stump.

No. 2.—By boring through the large roots of the tree or stump.

The first method is called an earth-hole, and this is the best method wherever practicable, the boreholes being rapidly prepared with very little labour, and the concentration of the charges of explosives well under the tree or stump will ensure success.

The second method is to bore the hole or holes in the spur or large roots of the tree or stump, sufficiently deep to burst the wood. By this process the charge, when fired, shatters the large roots and completely severs them from the trunk, whilst the united force from the concerted action of the various charges causes the tree or stump to be completely uprooted.

In preparing a borehole of the first or "earth-hole" description, the following instructions should be observed:—

Locate any possible opening between the roots for starting a borehole, taking care not to disturb the surrounding earth.

When an opening has been found, boring operations may commence, and for this purpose a crowbar or a 3-in. earth auger may be used—the latter for preference—and the hole bored under the tree or stump in a slanting direction towards the centre tap-root, or centre of the tree, using a little water to facilitate boring operations.

The operator must be guided by circumstances as to where holes should be bored, but a safe method to adopt is to locate the boreholes in such a way that all point to one common centre—viz., the heart of the tree—or, assuming the tree or stump to require three holes for blasting purposes, let the boreholes be so divided that each hole is carrying about one-third of the burden of the tree; in this way the tree or stump is balanced, so to speak, upon the three holes. If this system is adopted, good results will follow if the timber is sound. Should the tree be hollow, however, the holes should be carried under the sound portion, so that the charge has good confinement.

We have not room here to include particulars as to how the holes are to be charged and the cartridges fired, but hope to include particulars of this, with illustrations, in our next or the February issue. The explosives must be secured from a leading firm of makers, and the instructions issued by them, based, be it remembered, on years of experience, implicitly followed. If these are carefully observed, the best results will follow, and this method of land clearing will be found speedy, certain, and economical, especially in virgin forests.

Briefly, the points to be observed are as follows:—

(1) Locate the best positions for boreholes.

(2) Insert cartridges one at a time, and press firmly on bottom of borehole, using only a wooden rammer.

(3) See that the primer is gently pressed home, and in direct contact with the main charge.

(4) Tamp well and solidly.

(5) See that all connections are well made.

(6) Before connecting with battery, test your cable on galvanometer; and the circuit having been found complete, press down the rack-bar of the exploder firmly and quickly, and the desired results will be speedily attained.

The International Association of Tropical Agriculture, and the Coming (1913) Congress.

As already stated, the British Section of the International Association of Tropical Agriculture and Colonial Development, founded at the close of the first International Congress of Tropical Agriculture held in Paris in 1905, will be responsible for the organization of the third Congress to be held in London in May, 1913, and Professor Wyndham Dunstan, LL.D., F.R.S., &c., the President, Dr. Henry, the Secretary of the British Section, and others, are already at work making the necessary arrangements. The Association has its headquarters in Paris, and is governed by an International Board, from which an Executive Committee of from five to seven administrators is selected.

The work is mainly devoted to promoting investigations into questions of special importance to tropical agriculture, to publish the results of these inquiries, and to organize International Congresses for the discussion of the problems of Tropical Agriculture and Colonial Development. Two Congresses have been held already, and, as stated above, it is proposed to hold the third Congress in London in May, 1913.

Subscriptions for joining the British Section, £1 per annum, payable on January 1st of each year, may be paid by crossed cheque or money order, to the order of the Secretary, International Association of Tropical Agriculture and Colonial Development, British Section, and, in the case of money orders, should be drawn on the General Post Office, London. Letters and subscriptions should be addressed to "The Secretary, British Section, International Association of Tropical Agriculture and Colonial Development, Imperial Institute, London, S.W."

Members of the British Section will have the privilege of taking part in the London Congress without

further special payment. They will also receive all the publications of the International Association. In addition, the quarterly *Bulletin of the Imperial Institute* will be issued to them free of charge. A reading and writing room will be reserved at the Imperial Institute for the use of members of the Section when in London, and members will also be entitled to make use of the General Library and Reading-rooms of the Imperial Institute.

Death of Sir Joseph Hooker.

IT is with great regret that we have to announce the death of Sir Joseph Hooker, O.M., G.C.S.I., the distinguished botanist, who for many years was Director at Kew, as was his father (Sir William Jackson Hooker) before him.

Sir Joseph Hooker was in his 95th year, and has been well known for his botanical expeditions and studies since 1839 or 1840, when, after taking his M.D., he first set forth on what has probably been the most famous one-man series of scientific expeditions and adventurous journeys recorded. The part he acted in bringing out Darwin and Wallace, and inducing Darwin to read the now historical paper before the Linnæan Society on the evolution and origin of species, would alone have placed Sir Joseph Hooker in the forefront of the scientific world.

The Philippine Agricultural Review, Manila, Philippine Islands, issued their No. 8 Bulletin for August as a special forage number, and it is full of reports *re* experiments of the various forages tried and the results obtained, with special reference to horse-feeds in this case for the U.S. Army in the Philippines. Any one having stock in the Tropics to be fed, will find this number of the greatest use. Discussing coco-nut meal, this is used by dairymen in the vicinity of San Francisco, and may be used with advantage for swine and sheep, serving also as a partial substitute for oats with horses. The French War Department investigated the value of coco-nut meal for Army horses. The result proved that coco-nut meal was equal and even superior to the same weight of oats, and according to French prices of feeding stuffs, a substitution as in the above experiments would bring about a reduction in the cost of keeping Army horses of about $10 per head per year.

Mr. JOHN LOUDON BUCHANAN and Mr. John Kevan Greenhalgh have been appointed directors of Messrs. Lever Bros., Ltd., of Port Sunlight. Mr. Buchanan, the London *Daily News* tells us, has been with the Company about seventeen years, and has rendered valuable service in various departments connected with the chemical side of the business, latterly as chief chemist. Mr. Greenhalgh has also been for a long time associated with the Company in the important office of chief accountant. He entered the service of Messrs. Lever Bros. in August, 1892. Both these gentlemen have been acting as deputy directors for some time.

Legislation to Enforce the Notification of Plant Disease.

THE suggestions made by our Editor in his last book, that if necessary the State, or at least the local authorities, should be asked to assist in forcing careless or indifferent planters to fight plant diseases and pests, and so do all they can to keep the trouble within bounds, are recalled by a fine recently inflicted on a Lancashire farmer for failing to notify a disease in his potato crop. This caused the London *Daily Chronicle* to refer to the strenuous methods which went to ensure the ancient agriculturist against risks which could anyway be avoided. In Scotland of the fifteenth century, for example, there was a certain weed, "gule," against which the hand of every man was raised. It was a dangerous weed, and spread quickly. The tenant farmer watched for the first sprout much more eagerly than he sought the first green of his corn crop. For whoever fostered the weed—and its presence was evidence of a fostering spirit—was "punished as if he had led an enemy into the country." He died violently. The landlord, too, suffered for the sins of his tenants. For every plant of the weed that could be discovered on the land cost him a sheep. What is asked for in our "Notes on Soil and Plant Sanitation," therefore, is nothing new. If the planters, planters' associations, &c., can do as the old Scottish farmers did and keep the pests down, there will be no need for legal interference. We fear, however, the rough-and-ready ways of the fifteenth century will not be tolerated to-day, much as one would like to put them into operation at times. But, perhaps, very shame for being five centuries behind in their methods of crop preservation, will now cause all hands to look alert.

WRITING to us about the Rubber Exhibition which took place in London last July, Mr. G. Van Den Kerckhove, the well-known rubber expert, said that it was "a brilliant demonstration of the results realized in the domain of the systematic plantation of rubber trees. There remains, however, much to be done with regard to the yield of the trees and the coagulation of the latex.

"As I wrote previously, it will be towards 1915-1916 that, logically speaking, the quantities coming from the plantations will constitute an appreciable factor in the world's output, and although the planters have yet many fine days before them, I estimate that they must, by carefully planned and immediate work, be prepared to meet without trouble a somewhat lower value in the price of the raw material.

"What is the conclusion that must be drawn from the last London exhibition—here it is? The plantation companies must exert themselves to the full to increase their production, but in a practical way, and see that they only place on the European markets rubber of the very best quality, for it must be admitted that with regard to the preparation of rubber, progress has been rather poor. I have no hesitation in saying that 90 per cent. of the companies who actually send rubber to the European markets could improve their products and increase their value by from 2.50 frs. to 3 frs. per kilo.".

The working of the guano deposits in Peru constitutes an important industry in that Republic, and within the last eighteen years the Peruvian Corporation has, reports the *Pan-American Bulletin*, extracted a third of the 3,000,000 tons allowed under its contract. Illustrations show that the deposits, the same as in Chile, are conveyed along overhead cableways from one spot to another. Of late years great improvements have been introduced in this system of transport, and in centres like Mauritius, where "surra" among the cattle gives trouble at times, in the African tsetse fly districts and elsewhere, the advantages of overhead cableways cannot be overestimated. Messrs. Bullivants, Ltd., have already introduced several sets into Mauritius, Ceylon, Natal, &c., and are now working with us, as stated in our "Notes on Soil and Plant Sanitation," to popularize cable transport on rubber estates.

There is, claims the *Pan-American Bulletin*, a visible supply of nitrate deposits, which, allowing for the wonderful increase in the consumption on all sides, will last for the next fifty years at least, and that according to the most careful estimates.

According to the 1910 report of the Porto Rico Station, among the miscellaneous crops produced, the coco-nut brings the greatest revenue into the island. It is grown in a comparatively small area, i.e., the fringe of sandy beach bordering the coast line. The nuts are of superior quality, easily grown, and bear abundantly. It is almost impossible to buy a bearing grove. The area planted shows some increase, but the soils best adapted to the crop are pretty well taken up. The yield could doubtless be much increased by more fertilization and better cultivation. In most cases the groves are unplanted with other crops, though it is a good practice to grow small cultivated crops, especially beans, among the trees. The nuts are shipped whole to New York and are used largely by the makers of desiccated coco-nut for use in pastry, &c. About seven years are required for the trees to come into profitable bearing, but after that the crop is sure and the cost of maintenance low. The coco-nut bud rot is not known to occur here and such pests as are present are easily controlled.

While fully agreeing with the theory that no system of tapping of rubber trees which does not provide a four years' renewal of the bark can be described as sound, and, believing this to be recognized by most planters, although some may not be able from various reasons to adopt such a system, it would be interesting to experiment in tapping trees under 24 in. in girth on the half herring-bone system, one side the first year and the other side the second, then leave both sides entirely alone for two years. The girth should then be large enough to take three rows of tapping, 6 ft. up, on the half herring-bone or half spiral systems, round the tree, one each year. For the fourth year let the tree rest entirely and then, in the fifth year, start on No. 1 tapping again. These complete rests would, we believe, not reduce the eight years' output (from the time the trees were first tapped), and would, in the end, increase the receipts, or at least help to lengthen the life of the rubber tree.

"Tropical Life" at the Opera.

Mr. Oscar Hammerstein's New Opera House.

Acquiring our taste for music from the Latin races is probably the cause of our preferring Italian opera to those composed by the German school. For this reason, wishing to see Mr. Oscar Hammerstein's new Opera House at what we believed to be its best, we chose an evening to do so when Bellini's "Norma" was to be performed. Those responsible for the style and decoration of this magnificent national home for opera in England have chosen well, both as regards the building itself and the situation where it is placed. Its greater distance from the hub of fashionable London is more than compensated for by the many advantages it can claim as regards approach, for placed there, truly a King's house, in the Kingsway, turning out of the Strand, quite close to the Holborn Restaurant, the facility with which those who drive or motor to the house can approach, alight, and pick up their carriages and drive away under cover of the glazed roof which extends the whole length of the front of the building, some 200—300 yds., is without its equal, not only in London, but among the continental houses as well. The building, known as the London Opera House, is considered, both as regards its exterior and interior decorations, to be one of the most beautiful in the world, and certainly when lit up at night, its own brightness and gaiety, enhanced by the numberless motors and carriages coming and going, and their occupants picking their way under the friendly protection of the glazed covering, equals any picture conjured up of grand opera abroad. Inside, the building is the same, the large entrance salon, the floor of which, as elsewhere, is covered with thick red carpeting, in harmony with the delicate rose upholstery of the seats, leads to the lounge on the left around the tier of boxes or down to the stalls. Each box is provided with a large ante-room, where, if wished, supper can be set, or friends entertained away from the publicity of the boxes. Such conveniences are conducive of great pleasure to those able to indulge in such luxuries. The house itself is richly decorated in white and gold, with panels of stonework delicately carved to prevent any idea of heaviness or the great strength that must be there. This throws up the old rose upholstery of the stalls on the ground floor and grand circle, above the tier of boxes, which are also faced with carved stonework picked out with gold.

The acoustic properties of the house seem perfect, for we visited the "gods" on purpose to test this. There we could hear the artistes on the stage as clearly as if they were immediately below us. Want of space prevents our commenting on the opera itself, but of the house we can truly say that the management deserves the success that the taste of the architect and the enterprise of Mr. Hammerstein and his friends have made so bold a bid for. We trust and believe they will achieve it, and certainly, judged by the crowded state of the house in all parts when we were present, its success is assured.

Reviews.

THE RUBBER INDUSTRY. Being the official report of the proceedings of the International Rubber Congress held in London in connection with the Second International Rubber and Allied Trades Exhibition, June 24th to July 14th. Edited by Dr. Joseph Torrey and Mr. A. Staines Manders. 470 pp., with many illustrations and full index according to sections and lecturers. Price 15s. 6d. net. Postage in United Kingdom 1s., abroad 1s. 6d. per copy. London: The International Rubber Trades Exhibition, Ltd.; or TROPICAL LIFE Publishing Department, 83-91, Great Titchfield Street, Oxford Street, W.

"Good wine needs no bush," for more reasons than one. First, because it is so well known that no one whose opinion counts needs a recommendation; and secondly, because, as in this case, if you start to point out the many good things the book contains there would not be room enough in this month's issue for the lengthy notice required.

En passant, we warmly congratulate the joint editors on having got the book out so soon after the Exhibition, whilst the various subjects discussed and the points raised are still fresh in everyone's memory. There is not a subject raised that is not of prime importance to-day, and likely to remain so. Many of the papers, perhaps, offer increased interest with the march of events that has taken place since the Exhibition closed its doors, as, for instance, the question of the standardization of rubber, what is desired, and how can it be obtained. Leading experts discussed the question exhaustively at the Congress, and for this reason alone every planter and manufacturer will be forced to take up the book as a classic on the subject if they wish to be "in the running." The editors on this account were well advised in reproducing in this volume the important article contributed by Dr. S. Spence to the 1908 book, which he edited, on "An Historical and Descriptive Review of Rubber," concluding with a table of the various kinds, their scientific names, places of origin, &c. The fact that this alone was the cause of Dr. Spence's name being included would make anyone welcome the article, but its great intrinsic value will cause it to be closely studied on account of the information it contains. Altogether forty-three papers are included, apart from the introduction by Dr. Spence, and as but few of the lecturers were included in the book of the 1908 Congress, the number of opinions that can be consulted by those possessing both books is increased. Of the papers themselves, Ceará and Funtumia rubbers are discussed in Mr. Fyffe's paper, which starts the book, and is followed, first by detailed particulars of the Madagascar rubbers, and then by Mr. Stockdale on the indigenous and introduced kinds in the West Indies. Dr. Carnegie Brown, in his "Maintenance of Health in Rubber Planting Districts," forcibly points out the necessity of having a reliable and readily available supply of good water; and whilst the lecturer referred only to human beings, it will, we feel certain, soon be realized by every planter worthy of the name that pure, effectively sterilized water is equally necessary for washing the rubber. Foul water will no more turn out clean rubber of good colour than it will turn out clean, white clothes. It is no good to keep your latex pure and free from discolouring matter if you wash the resultant rubber with the filthy water one far too often sees dripping on to the rolls. "The average number of trees per acre may still be taken at about 150," Mr. Kelway Bamber tells us in his lecture, "but wider planting, with from 40 to 48 trees to the acre will no doubt in time give larger and more productive trees, capable of renewing bark freely." Every word of this paper will be carefully studied and read time and again by careful rubber men. Dr. Jacques Huber's (Director of Museu Goeldi at Para) and Mr. H. A. Wickham's (who brought the first seeds to Kew) papers should be noted and compared, whilst those turning to Dr. Lierke's paper on "Manuring Rubber Trees" will find the last word offered by one of the leading authorities on the subject.* Mr. J. Mitchell (Mycologist to Lanadron) gives valuable information on Hevea diseases, and we regret that Dr. Petch, whom we had the pleasure of meeting at the Congress, did not follow Mr. Mitchell's example. Elsewhere in this issue we give a full list of the papers that were read, which we cannot do here. Another time we would suggest that some of the many excellent photographs taken during the Exhibition, as of the dinner, the Congress, of the Exhibition itself, distinguished visitors, &c., should be included, if only as a souvenir of the very pleasant time that all those connected with the Congress and the Exhibition spent together.

In conclusion, we add that we hope those anxious to see the question of labour placed on as sure a basis as possible will read and criticize the paper contributed by our Editor on "The Organization of Tropical Labour." Important as the question was in July, present prospects lead one to believe that it will become much more so in the immediate future. We trust, therefore, that the remarks on the subject, both in this report of the Rubber Congress as well as those contributed to Grenier's (1911) "Rubber Annual," will cause officials and planters alike to evolve some system of organization so as to avoid any chance of stagnation in the ebb and flow of the labour supplies, which are as necessary to the prosperity of the Tropics as blood is to the human body.

SINCE the Rubber Exhibition we have had many inquiries about the catalogue. We therefore beg to inform our readers that a few copies of the catalogue are still available, and will be found very useful if used with the official report of the Congress, which we review at length in this issue. The catalogue contains over 600 pages of matter, including 45 copyright articles by leading experts, and over fifty photographs of those who took a leading part in the Exhibition and the Congress. Naturally the postage is heavy, but, including postage, Mr. Manders, from

* Our Editor would like to point out here that he did not see a proof of the remarks he made on Dr. Lierke's paper, or would have altered it in several respects. As we are publishing an article on the matter of "Wide *v.* Close Planting" in our February issue, those interested in the matter of large girth *v.* tall trunks will then see more plainly what we wished to convey to those present at the Congress.

75, Chancery Lane, London, W.C., can still supply copies at 1s. 6d. each for the United Kingdom and 2s. post paid abroad. We believe the book cost over 3s. to produce.

Adventures in Search of a Living in Spanish America, by "Vaquero." A book full of interest to Spanish Americans. 304 pp., with 70 illustrations from photographs by the author, and three charts or maps showing the routes taken. Price, 9s. 6d., post free. Tropical Life Publishing Department. Bale, Sons and Danielsson, Ltd., 83—91, Great Titchfield Street, Oxford Street, W.

Students of modern Mexico, anxious to see the Republic flourish and make the most of its splendid possibilities, cannot shut their eyes to the fact that to "wake up" Mexico is a big job. Poor soil, lack of forests, a worse than useless class of native, who does nothing himself to add to the national wealth and resents the presence of foreigners to do it for him, are three drawbacks that will need a lot of "doing" to overcome. Lumholtz, in his book on Mexico, drew a useful picture, and gave us valuable information on the various Indian tribes to be found within the boundary of Mexico; but had he let our friend Prof. Francis Lloyd, who accompanied him, also give us particulars of the land he passed through and the nature of its soil, those who, like ourselves, are anxious to know why Mexico does not thrive would have been better able to realize the reasons. In this book Dr. "Vaquero," an English medical man, gives very detailed particulars of a considerable area of Mexico, its soil, inhabitants, &c., he passed slowly through, living almost like a *peon* or *charro* himself for some years, as he depended for a living on the dollars and half-dollars he received from the natives for medical attendance; and those who know how reluctantly the lower classes in Mexico, or anywhere else in Latin America, part with their money for medical advice, will realize what Dr. "Vaquero" had to put up with. To the ordinary reader the details given might appear at times somewhat monotonous, but to anyone anxious to reform and organize Mexico and her people this book deserves careful attention.

It certainly is worth reading, and reading carefully, as it gives a faithful likeness of the Indians, and those of mixed blood, as well as of the purer Spanish creoles, that are to be met with "*chez-eux*," off the usual beaten track from Cuba to New Orleans, through Mexico to Coatzacoalcos, on the Atlantic side, then across to Salina Cruz, and down the Pacific by steamer as far as Puerto Montt, in Chili, and finally back to Cuba by way of Guayaquil, Panama, and Jamaica. The doctor apparently set forth to find a lucrative practice at some town along the route, and although he did not succeed, and never seemed to have a single stroke of luck during the six years he was "on the road," his descriptions of the people among whom he lived, their likes and dislikes, their habits and prejudices, will prove of great value to those, especially throughout Mexico, who wish to see Spanish America come to the front as a producing centre. We say this, as the details given drive home, in a way no other book does that we remember having read, what a barren soil and people are to be met with in many districts, so that those who wish to improve both and make Spanish America and her people thriving and prosperous have a "tall job" before them. The same way as the United States had to make Panama healthy and sanitary before she could expect to complete the Canal, so will it be necessary to raise almost out of recognition the prejudiced, lethargic races, without ambition, energy or desire, that inhabit the regions traversed, and even when that is done there is still the soil to be considered. From Dr. "Vaquero's" book one cannot help asking which is the most hopeless, the people or the territory they inhabit? Of course, there are exceptions, but these only help to throw the others up into a still more unfavourable light. Perhaps a professional man so unable to benefit himself was not the best one to write such a book. At the same time, as already stated, there is much in it that should be carefully studied. We have done so, and recommend others to do the same.

A Manual of Philippine Silk Culture, by Charles S. Banks. 53 pp., xx plates (36 illustrations, with plan of a silk house, and design of a hand machine for silk reeling). Full index. Published by Bureau of Science (Department of the Interior), Manila, Philippine Isles.

The price of this excellent manual is not stated, but judging by the other publications issued by the Department, it will probably run about 50 cents to $1, postage extra. Those interested in sericulture, an industry which we are glad to see is making considerable strides outside China and Japan, will find the author's instructions and the many years of experience that he places at our disposal through the book of the greatest use. Mr. Banks, who is attached to the Entomological Section, Biological Laboratory, Bureau of Science, Manila, has studied silkworm raising and sericulture for many years. It includes all sections, viz., the varieties of worms, importation of eggs, enemies, and insect pests, the silk house, mulberry trees and their culture, shipment of eggs, and many other items, each of which are passed in review, carefully dealt with and explained. Having just received an order for a book on sericulture, we at once sent on our review copy, and have written across for another.

Mr. Charles E. Moore, the well-known rubber share broker, of Pierpont Street, Worcester, has issued a handy booklet on the present position of the Rubber Share Market generally, and of six companies in particular. As the booklet seems available in exchange for a penny stamp, Mr. Moore should have a great run on the edition.

They are right who say that it is impossible to exaggerate the importance of the work which is being accomplished by the distinguished group of scientific men associated with the Wellcome Tropical Research Laboratories attached to the Gordon Memorial College, Khartoum, under the leadership of Dr. Andrew

Balfour, its able Director. This is further confirmed by the first part, Vol. A, of the fourth Report, which has just been issued by Dr. Balfour and his colleagues, as attention to the 400 pages (including many illustrations and coloured plates) shows that it contains careful records of the exhaustive and minute research work that the staff has been engaged in since the last report appeared in 1908. The volume under review deals with the conditions of tropical life in Egypt and the Sudan, whether of men, animals, plants, or insects, and their possible effects for evil or for good on the agriculture and trade of the place. Vol. B, relating to general science, is promised shortly, and there will also be published a supplement reviewing the whole. A handy circular accompanies Vol. A., giving the cost, weight, &c., for posting, and further particulars of all the reports issued since 1904, when the first one appeared. We see that Vol. A of the present one weighs 61 oz., and costs 21s. net. Vol. B will weigh 52 oz., and will cost 18s., whilst the supplement will weigh 60 oz. and cost 15s. Messrs. Baillière, Tindall and Cox, of 8, Henrietta Street, Covent Garden, London, are the publishers; but any or all of the reports can be obtained from TROPICAL LIFE Publishing Department.

Los Centenarios Sud-Americanos de la Independencia.

POR QUÉ NO CELEBRARLOS EN LA EXPOSICIÓN DE CAUCHOS DE NUEVA YORK?

LA AMÉRICA LATINA, como todo el mundo lo sabe, está celebrando actualmente los centenarios de sus varias Repúblicas: es decír, que de un año para otro uno ú otro de sus países, por medio de una expositión ú otra celebración nacional, está notificando al mundo que ha estado independiente de las influencias exteriores durante cien años. Primeramente era la Argentina, y Chil ey Méjico: ahora es Venezuela, y luego Paraguay y las demás Repúblicas. Allá por los años 1810-11 una tras otra de las veintiuna Repúblicas sacudió el yugo de los Européos y firmó una declaración de independencia. São Paulo, á su vez, se está preparando á celebrar, por medio de una exposición internacional que tendrá lugar en 1922, el centenario de la independencia del Brasil, porque fué á orillas del Ypiranga, pequeño arroyo cerca de la ciudad de São Paulo, según nos dice el *Pan-American Bulletin,* que Dom Pedro I, el 7 de Setiembre de 1822, proclamó primeramente la independencia del Brasil. Mientras se felicita á las varias Repúblicas en su conjunto por el maravilloso progreso que han hecho (á pesar de guerras, de desórdenes locales, la falta de población y de capital, y, al principio, un clima insalubre y una autoridad insuficiente para la sujeción de las facciones rivales que luchaban por salir adelante), no se puede evitar el reflexionar sobre lo que podrán tener en reserva para ellas los próximos cien años, por lo que hace á su desarrollo comercial y agrícola. Como en otra parte decimos, mientras que en el siglo pasado se ha visto la fundación y establecimiento de estas Repúblicas Latinas como importantes eslabones para completar la cadena de naciones cívilizadas que ahora círcunda al mundo, en el siglo venidero, si estas mismas Repúblicas han de continuar á extenderse y prosperar, se verá, del mismo modo y en igual grado, abrirse y desarrollarse sus inmensas potencialidades agrícolas, mineras y comerciales.

(No sería, por consiguiente, una idea excelente aprovecharse de la Exposición Internacional de Cauchos de 1912 en Nueva York, como uno de otros tantos medios, para celebrar los centenarios unidos de las Repúblicas Pan-Americanas, llamando atención á ellas de una manera llamativa como centros productores del caucho, tanto el plantado por sí mismo, como el indígena.) Si esto se hiciera, Pan-America, dentro del mismo cubo de la rueda de su comercio, podría probar por medio de las variedades de caucho que son suyas para mostrar, lo que ella sola es capaz de producir. Aquí en la Ciudad Padre* de las veintiuna Repúblicas, los productores podrían convencer enfática é incontestablemente á los grandes compradores y manufactureros de las muchas ventajas de sus cauchos como materia prima. Era precisamente una tal presentación unida que tanto tratamos de arreglar para la Exposición de Londres, y sólo nos impedió el llevar á feliz éxito nuestra intención el mucho trabajo que teníamos y la falta de alguna colectividad organizada para ayudarnos. Pero, en América la situación es muy diferente. Dejando á los centros productores principales el hacer presentaciones individuales, como lo hicieron en Londres el Brasil, Méjico y Bolivia, etc., una presentación llamativa unida, hecha por la Unión Pan-Americana bajo la digna dirección del Honorable John Barrett, Don Francisco Yanes, el Director-Ayudante y la Junta Directora Pan-Americana de Washington, D.C., en colaboración con los Ministros de Agricultura de los innumerables Estados que componen las varias Repúblicas, sería un anuncio muy efectivo y permanente del caucho americano. La colección representativa así formada se podría instalar en algún lugar espacioso, precisamente como el que se facilitó para las presentaciones unidas de Malaca, Ceilán, la India del Sur y las Colonias Alemanas, etc., en Olympia en 1908 y en el Agricultural Hall en el año actual, en el cual lugar podrían reunirse libremente los productores, embarcadores, compradores, y manufactureros para examinar y criticar las muestras, y hacer sugestiones de como se podría mejorar su calidad y hacerla más propia para el trabajo á que los cauchos se destinan. Además, los representantes gubernamentales y los propietarios de fincas ó *estradas*, etc., podrían discutír entre sí, ó con otros peritos, cuestiones tan dificultosas como la de los mejores métodos de extraer, coagular, preparar y empaquetar el caucho, sea éste *hevea*, *manihots*, *castilloas*, *sapiums* ó *hancornias*, etc. La cuestión entre Estado y Estado, y entre República y República, de los derechos de exportación, el transporte mejorado y más barato por río y por tierra, el plantío en tierra alta de provisiones para los extractores del caucho, y todo lo que puede tender á reducir el costo de la producción y permitir así á los centros sudamericanos competir con éxito con el Este, podría y debiera ser díscutido á fondo, si el Brasil, Bolivia y el Perú han de desarrollar sus bosques de caucho con toda ventaja. En Londres, el Sr. Staines Manders tuvo la amabilidad de poner á la disposición de los interesados en el caucho indígena una sala aparte, y hará lo mismo, sín duda, si es posible, para los productores pan-americanos en Nueva York. En todo caso, si las Repúblicas toman un lugar para una presentación unida digna de ellas, deberá, por cierto, ser tan espacioso como el que ha obtenido el Brasil para sí solo en Londres; una tal área, cuando menos, sería necesaria para permitir la colocación de las muestras, y la reunión de los varios representantes para la discusión de cuestions ce común

* Concediendo que Filadelfia sea la Madre.

interés. Esperamos sinceramente que esta idea se adoptará, y que un tal lugar se conseguirá.

Black v. White.

THE *Colonial Office Journal* for October included an article on "The Natives of Southern Rhodesia," that we read over several times, and the more we did so, the more truthful we found it. It was Olive Schreiner, we believe, who said the trouble over coloured races is not between the pure black and the pure white, but between the halves, quarters, and eighths; and she is right. Added to this, however, is a fact that is very trying to those who wish to see the world run smoothly, and its inhabitants happy and prosperous; and it is a fact as true as it is trying, viz., those pure whites who make the most fuss about black and coloured people, are generally the ones who have the least right or reason to do so. Empty vessels make the most noise, is very true when applied to most of those who are fond of shouting out, or talking loudly about "d——d niggers," and that sort of thing. Sometimes one wonders whether these ill-bred specimens of the dominant races feel quite so certain of their superiority over the coloured man as they would have you believe. "Good wine needs no bush," and a really elevated nature needs no oaths and brutal discourtesy, often actual cruelty, to assert its superiority. For these reasons, therefore, we often wish, for the sake of the white race, that some of its members had more self-respect, as that alone can prove to the coloured and black races that we are their intellectual superiors. We remember hearing one of these empty vessels finding fault with the English wife of an Englishman for dancing with a negro—a pure-blooded negro—at a ball. "I believe I should shoot my sister, or the nigger," he said, "if I saw her with a black man's arm round her waist like that." "Don't trouble, old chap," replied a friend; "it is not the black man's arms round the white women's waist that cause trouble here, it is the number of you chaps that will go putting your arms round the black girls' waists that leads to so much mischief." It was only a jest, and perhaps not too refined a one at that, but the truth of it made up for the lack of refinement, and the spirit of the man who made the joke certainly appealed to us as being preferable to that of the other, who was so frightened of being contaminated by the black man at the official balls, whatever he might think of the black and coloured girls at the "dignity balls" that were held elsewhere.

This may seem harping a little behind the scenes, or telling tales out of school, but doing so can hurt no one in this case, certainly not the man who talked of shooting the "nigger," and if someone at times does not help in this matter of black and coloured *versus* white, things are likely to get worse instead of better. No one is perfect in this world, which is as well, for it would be a mighty dull place if they were, and this being so we do not believe in professing that men can be kept sober or "straight" by legal restrictions; but at the same time there are limits, and if some of the self-satisfied individuals to be met with in the Tropics, as elsewhere, can only be made to realize that if some of those around them, whether white or coloured, may not always come up to their theories (the less said about practice the better) as regards social and moral equality, they can still be extremely useful in the development of the world, which will never be exploited and opened up without the assistance of the coloured races.* There is plenty of room for all, especially in the Tropics, far too much in many cases, and if those who aggravate the position of black *versus* white by their indiscreet behaviour and remarks would only be content to leave it to the black man, who is no fool, to *see* who is the best man, without insisting on telling him so often and so loudly, labour conditions generally would improve, better feelings would prevail between the races, and the respect that all blacks have for decent whites would be greatly advanced in all ways.

Hevea Stumps doing well in West Africa.

THE CHRISTINEVILLE RUBBER ESTATES, in Sierra Leone, West Africa, having gone through the cleansing fires, now seem to be going strong, as we understand that the manager reports having planted a further quantity of Robusta coffee and 480 kola, bringing the total of plants placed in the field during the year to:—

Manihot rubber	8,185
Hevea rubber	5,000
Cacao	5,407
Kola	7,544
Coffee Robusta	16,160

Of the Hevea stumps planted (supplied by Mr. Stuart R. Cope, of London) over 80 per cent. are reported as being in good condition, and the manager says he is pleased with the results obtained with this variety of rubber up to the present. Such a report is of importance not only to the Christineville shareholders, but also to the large number of companies and individuals who are engaged in planting up Hevea stumps and seeds on the West Coast and elsewhere in Africa.

MESSRS. ZORN AND LEIGH-HUNT'S Havre correspondents point out the rapid way in which the trade in Robusta coffee is expanding, while prices show a big jump. Sales have lately been effected at 67s. to 72s. per cwt., as against 46s. to 50s. last year. This is, of course, a most important point for those companies (mostly in Java and Sumatra) which grow large quantities of Robusta coffee as a catch crop or in joint cultivation with rubber. Experts assert that as the trees mature the quality as well as the quantity will improve. The same correspondents express the opinion that coffee is likely to keep at high prices for some time to come, and state that it is next season's crops which are at present being sold at the prices mentioned above. The demand for Robusta seeds in Southern India is evidently very keen, for we see by *The Planters' Chronicle* that the United Planters' Association report "stocks of *Coffea robusta* and *Tephrosia purpurea* seed are exhausted, demand having outrun supply."

* The King's decision to hold a Durbar, says the *Times of India*, is regarded by many Indians as a subtle rebuke to the intolerant attitude of the Colonies, and a chivalrous assurance of His Majesty's unalterable affection and regard for his Indian people. We are glad to see this.

"Tropical Life" Friend.—No 78.

Lieut.-Col. J. A. Wyllie, F.R.G.S.

"Our Friend" is an Edinburgh man, having been born in that city in 1855. Educated at Edinburgh High School, and then at the Royal Military College, Sandhurst, Colonel Wyllie passed on to Gray's Inn, London, and might now, had he kept his final terms, claim the rather uncommon distinction of being a barrister as well as a soldier. Intending originally to practise as a barrister, he changed his mind, and instead of doing so he entered the Army in 1875 as Sub-Lieutenant in the 16th Foot (now 2nd Battn. Bedfordshire Regiment), and from this regiment, in 1877, was transferred to the Indian Army, on the lists of which he remained until his retirement in 1909. After some years of regimental duty, "Our Friend" entered civil, and subsequently political employ in the Madras Presidency, in which he remained for nearly seven years (from 1881-1887), when he returned to Europe on furlough, spending the greater part of two years in Spain and Portugal, where he acquired the languages so perfectly that he was graded as Army Interpreter in French and Portuguese, whilst he has also qualified in Spanish.

In 1894, on the re-organization of the Cantonment Magistrates' Department by the Government of India, he elected for service in that branch of the Indian judiciary, and was appointed to Rangoon, where he remained till 1902 without a break. Cantonment Magistrates, it may be explained, in addition to the duties of the Bench, have municipal and revenue functions, and it was in the exercise of these that Major Wyllie, as he then was, had his attention attracted to problems of tropical agriculture. The local sanitary authorities having objected to the raising of foodstuffs on a sewage farm belonging to Rangoon Cantonment, it became urgent to discover some unobjectionable substitute which would not spell loss of revenue. This was in 1896-97, at a time when Ceará rubber had been discredited, and Pará rubber had been condemned as unprofitable by botanical specialists. Major Wyllie, however, held the opinion that there was something in rubber notwithstanding the practical difficulties, and undertook a series of experiments with the various indigenous rubber vines of Burma—*Chavannesia esculenta*, *Willughbeia edulis*, and *Parameria glandulifera*—all of which proved dubious for one reason or another. After examining the possibilities of *Ficus elastica* (Rambong rubber) and *Manihot glaziovii*, he elected to rely exclusively upon *Hevea brasiliensis*, of which cultivation he may claim to have been one of the earliest pioneers in Burma.

With the hearty support of the then Governor of Burma, Sir F. W. Fryer, the sewage farm in question was converted into a rubber plantation, without, however, discontinuing the original purpose of it. The combination was a lucky one, and the young plants throve amazingly. Just then, however, an unfortunate affair occurred, quite apart from the question of rubber, which eventually led to the abandonment by him, for a number of years, of his experiments in that province. Those who were in the East in 1899-1900 will remember what was known as the Rangoon outrage case, a peculiarly abominable affair in which no less than half a company of British soldiers took part—in broad daylight, almost on the steps of the most sacred Buddhist temple in Burma—the Shwe Dagon Pagoda of Rangoon. The regimental and higher military authorities were misguided enough, instead of affording the civil and judicial officers (prominent among whom was Major Wyllie as the magistrate in whose jurisdiction the affair had taken place) the help the latter demanded, to oppose every possible obstacle to their investigation in the hope that the facts might be hidden from the public. But Lord Curzon was then Viceroy, and they reckoned without their host, as they discovered when too late.

The attitude of the military authorities towards the soldiers implicated was that of a father-confessor to a penitent. Not only did they go through the farce of holding a military court of inquiry concurrently with the proceedings of the magistrate, but under instructions from higher authority they refused to give the civil power the assistance it was their duty to do, setting up the plea in Major Wyllie's court that their knowledge of certain facts material to the prosecution was privileged—privileged *against* the Crown, in a Crown prosecution! Of course this contention had to be overruled, upon which one of the officers of the regiment implicated took upon himself to stop, in court, the statements which the accused men themselves were willing to make. And when the men were committed to a higher court, and a jury containing not only ex-soldiers, but soldiers actually serving (exception having been taken by their counsel to jurors not of pure European extraction), failed to convict, the magistrate's record in the case formed the basis of drastic action on the part of the Government of India against the military—a fact the military authorities did not forget in their subsequent relations with the magistrate, whose transfer from Burma they ultimately succeeded in effecting.

(*Continued on page* 247.)

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

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6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

DECEMBER, 1911.

England's Chances in Latin America.

ARE WE NOT ALLOWING OTHER NATIONS TO SECURE THE BENEFITS THAT WE ARE ENTITLED TO?

EVEN the most backward and unimportant Republic of Latin America has a future—a great future—before it in comparison to its present relative importance in the trade and commerce of the world. If this is so with the small backward States, what must it be with the giants, as Brazil and the Argentine, with Chili, Peru, Uruguay, and the others? It behoves this country therefore to watch these Republics much more closely from now on into the future than we have been doing in the past. By watching, we do not mean official attention in the form of consular and other reports, or an occasional article in a leading newspaper showing the exhaustive academic knowledge of a university student or of a Professor Dryasdust type, but a real, live, personal and individual attention in the rising States that range from Mexico to Patagonia, with accurate knowledge of their names, rulers, locality, population, industries, and present and future prospects as centres of trade with this country. Up to now this knowledge has not existed among the rank and file of our people, the consequence being that Englishmen as a whole are unaware of the exceptional advantages many centres in Spanish America offer to those needing fresh outlets for commercial and agricultural undertakings. The life, no doubt, would not be all roses at first, but then neither is it to many, perhaps to most, people over here; but once a start was made on an organized and carefully planned basis the benefits to everyone concerned and to furthering and assuring the increase of this nation's prosperity would be incalculable.

Although America with its Monroe doctrine must always command, at least politically, a dominating influence throughout her sister Republics "down South," this has not prevented England from investing thousands of millions in South America; millions from which she would obtain a much surer direct profit and larger indirect benefits than she is doing, if more of her sons were as willing to give their personal help by going out to assist in building up this Latin-American trade, as our large banking establishments have shown themselves willing to give, and to give unstintingly, of their money to bring this about. As it is, America, south of New York, is practically an unknown quantity to the people of England. Since Spanish is the national language of Mexico, many will tell you off-hand that Mexico is in South America, and then wish to argue with you when you point out that letters or catalogues printed in Spanish are no use in Brazil, that Spanish is the national language of the whole of South America. Nicholás Gonzalez, of Guatemala, does not exaggerate in his book, "Desde el Llano" ("From the Open"), when he complains that trivial events in Europe are given detailed descriptions in the papers on this side, whilst the movements and events of the greatest importance in Latin America are ignored. No one can deny that this is so, and to a large extent this is the fault of the Press.* The Press caters, it is true, for the public, but they are, at the same time, the most powerfully educating body on earth, and so if they could but be induced to give a weekly, if not daily, column to Latin America news, to accustom the public to the names of the leading men, the chief centres of trade, and the more important events of the day, &c., out there, they would, we feel sure, greatly extend their own influence and circulation; and what is of far more importance (as the papers themselves would be the first to admit), the influence and trade of this country with those living south of the United States of North America.

The Latin American, be it remembered, comes from a good stock, and if he has a dash of Indian in him, all the better, as through that he has become thoroughly acclimatized to the life and climate. As Dawson tells us, in his "South American Republics," the Latin American can claim as ancestors the Greek, with his literature and arts; the Roman, with his powers of colonization and organization; the Visigoth, with his love of fighting and the Moor with his taste for architecture and science. This is no exaggeration, for when the last-named drove the Iberian Visigoths up into the mountains, until they in their turn were strong enough to retaliate by expelling their conquerors, a portion of the descendants of these Goths, with the dialect they had acquired, settled on the Atlantic Coast and founded what is now known as Portugal, and spoke the Portuguese dialect; whilst the others, together with what Moors and their descendants were left, built up the kingdoms of Arragon, Castille, and other cities, and through them the Spain of Ferdinand and Isabella. From these people, therefore, has sprung

* As when Pierpoint Morgan tripped in church the other day, and dropped the collection plate, even the stock markets were affected, owing to the lengthy and sensational reports issued in connection with this little episode.

the Latin American of to-day; truly no mushroom growth, but a people of good blood and capable, with the help of Europe's surplus population, of carving out in the future mighty cities and trade centres of their own, as their forbears did before them.

For these reasons we cannot help looking across the Herring Pond with envy at the progress being made in furthering and fostering the Latin-American trade with the States, through the Pan-American Union at Washington, thanks to the influence of the Governing Board and those working for the good of the cause in that city and elsewhere, and also thanks to their excellent organ, the *Bulletin of the Pan-American Union*, with its English, French, Spanish, and Portuguese edition; and last, but not least, to its Director-General, the Hon. John Barrett,* and the Assistant-Director, Francisco Y. Yanés. What this Union and its bulletin is doing to benefit the trade of our North American cousins, the English Press must try and do to benefit the trade of this country with South America.†

The year 1912 would be a most appropriate one for initiating an educational campaign to bring about increased knowledge of and interest in Latin America among the middle and upper middle classes of this country; that is, among those most able and likely to supply the brains and money necessary to advance English influence and trade in South America. We say this because it is now that the Latin Americans are celebrating the centenary of their liberation from the yoke of Europe, the yoke that kept them down and held them back for so long. For 100 years have they been free to fight out their future, and although if here and there they still show instability and lack of experience, generally speaking they have shown praiseworthy progress from a political point of view, compared with other nations during the same period. If, therefore, the century of 1810-1910 has been usefully spent in establishing the political and national importance of the Latin Republics, 1910-2010 will undoubtedly witness the establishment and expansion of the vast commercial, mining, and agricultural resources which lie there still undeveloped, and in many cases unsuspected and unknown.

Whilst, as Messrs. Zorn and Leigh-Hunt rightly point out, the possibilities of South America, as a whole, have been fully realized, little attention has yet been paid to those States likely to benefit from the completion of the Panama Canal. In the awakening which the new waterway will inevitably bring to that

* See "Our Friend," January, 1907.

† If we cannot run a Branch of the Pan-American Union in London, why not establish an Anglo-Pan-American Association or Society? What an advantage such an institution would be for organizing the raising of loans, distribution of crops, and the discussion of financial, commercial, and agricultural questions of prime importance.

The Origin of the International Rubber Exhibitions.

A SPOT OF HISTORIC INTEREST TO THOSE INTERESTED IN RUBBER.

The two X's indicate "pelles" or hams of Brazilian rubber exhibited at the Travel Exhibition of 1907, so ably organized by Mr. A. Staines Manders, some little time after the close of the Ceylon Rubber Exhibition in 1906, of which Sir Henry Blake, G.C.M.G., was also the President (see the London Rubber Exhibition Catalogue, 1911, p. 533, from which this photograph is taken). It was whilst looking at these two "pelles" of Hard Fine, with Mr. Manders, that the Editor of TROPICAL LIFE discussed running a series of rubber exhibitions on the lines laid down in his article written in December, 1905, and published in TROPICAL LIFE for January, 1906, nine months before the opening of the Ceylon Show. On this and subsequent conversations were laid the foundations of the important rubber exhibitions, two of which have already been held in London, as well as those to take place next September in New York, and again in 1914 in London.

part of the world it seems that Colombia, for instance, must share. Here we have a fertile country known to be rich in minerals, with a coast line of nearly 3,000 miles broken by many commodious bays. Owing to bad government very little progress has ever been made; the scanty population, general poverty, and absence of roads has limited exploitation, and naturally delayed the cultivation of the soil.

That material prosperity produces stability of government may be accepted as an axiom. Argentina and Brazil are brilliant examples, and therefore it must be expected that an increasing commerce would gradually eradicate the revolution habit. Already the country is showing some desire for progress; roads are being systematically made, and greater facilities given to capitalists.

Like our King, therefore, we call out "Wake up, England," and send your sons—as you have already sent your money—to secure your share of the increased prosperity and the increased elbow-room that Latin America is willing to bestow upon those who, by showing appreciation, prove worthy to receive them.

The Latin American Liberation Centenaries.

Why not Celebrate them at the New York Rubber Show?

Latin America, as everyone knows, is now celebrating the centenaries of its various Republics; that is to say, from year to year one or other of her countries, by means of an exhibition or other national celebration, are notifying the world that they have been independent of outside influences for a hundred years. First it was Argentina, Chili, and Mexico; now it is Venezuela, then comes Paraguay and the other Republics. Round about 1810-11, one after another of the twenty-one Republics threw off the yoke of the Europeans and signed a declaration of independence. Sao Paulo, in its turn, is preparing to celebrate, by an international exhibition, to be held in 1922, the centenary of the independence of Brazil, for it was on the banks of the Ypiranga, a small stream near the city of Sao Paulo, so the *Pan-American Bulletin* tells us, that Dom Pedro I, on September 7, 1822, first proclaimed the independence of Brazil. Whilst congratulating the various Republics as a whole on the wonderful progress they have made (in spite of wars, of local disturbances, lack of population and capital, and, at the start, an unhealthy climate and indifferent authority over the rival factions fighting to come to the front), one cannot help pondering as to what the next hundred years may have in store for them as regards their commercial and agricultural development. As we state elsewhere, whilst the past century witnessed the foundation and establishment of these Latin Republics as important links in completing the chain of civilized nations that now encircle the world, the coming century, if these same Republics are to continue to expand and prosper, will, in like manner, witness the opening up and development of their vast agricultural, mining, and commercial potentialities to a like degree.

On this account, would it not be an excellent idea to take advantage of the 1912 International Rubber Exposition in New York as one means of celebrating the united centenaries of the Pan-American Republics, by calling attention to them in a striking manner as rubber-producing centres, both self-planted and indigenous? If this were done, Pan-America, at the very hub of her wheel of commerce, could prove by the varieties of rubbers that are hers to show, the varieties of rubber that she alone is capable of producing indigenously. Here in the Father City* of the twenty-one Republics, the producers could drive forcibly and undeniably home to the large buyers and manufacturers the many advantages of their rubbers as raw material. It was just such a joint exhibit that we tried so hard to arrange for the London Exhibition, and were only prevented from carrying our intention to a successful issue by extreme pressure of work and the lack of any organized body to support us. In America, however, the situation is very different. Leaving the chief producing centres to include individual exhibits, as Brazil, Mexico, Bolivia, &c., did in London, a prominent joint display, brought together by the Pan-American Union, under the able directorship of Hon. John Barrett, Mr. Francisco Yanés, the Assistant Director, and the Pan-American Governing Board at Washington, D.C., in collaboration with the Ministers of Agriculture of the numberless States that go to make up the various Republics, would be a striking advertisement for all time of American rubber. The sample collection thus formed could be housed in a roomy space, exactly as the joint exhibits of Malaya, Ceylon, Southern India, the German Colonies, &c., were provided with at Olympia in 1908 and the Agricultural Hall this year, so as to enable producers, shippers, buyers, and manufacturers to meet on common ground, examine and criticize the samples, and make suggestions as to how their quality could be improved and rendered more suitable for the work for which they are destined. Again, the Government representatives, the *estrada* or estate owners, &c., could discuss between themselves or with other experts such knotty questions as the best methods of tapping, coagulating, preparing, and packing the rubber, whether *hevea*, the *manihots*, *castilloas*, *sapiums*, *hancornias*, &c., Inter-State and Inter-Republican questions of export duties, improved and cheaper river and land transport, planting up the high forests and hinterlands, with provisions for the rubber tappers, and all such matters that tend to reduce the cost of production, and so to enable the South American centres to successfully compete with the East, could be and should be exhaustively discussed if Brazil, Bolivia, and Peru are to develop their rubber forests to best advantage. In London, Mr. Staines Manders kindly offered to place a separate room at the disposal of those interested in indigenous rubber, and no doubt he will do the same, if possible, for Pan-American producers in New York. In any case, if the Republics take a space for a joint exhibit worthy of themselves, it should certainly be as large as that secured by Brazil alone in London;

* Allowing Philadelphia to be the Mother.

such an area, at least, would be needed to allow room for the samples, and for the various representatives to meet together and discuss questions of common interest, either privately or at the general Congress. We only hope that this idea will be adopted and such a space will be secured.

In conclusion, we would add that, in face of the friendly and healthy, but at the same time serious, strenuous, and well-organized competition with which the East is already challenging the West as a rubber producer, it behoves the Federal Government of Brazil to select a thorough rubber expert to represent them at so important a centre as New York—one, too, that is a good linguist, at least so far as English is concerned. We certainly missed Mr. Hippolyte de Vasconcellos' genial presence at this year's Rubber Show, having found him so useful at the previous one in 1908, where he was always at hand ready to answer the most complex questions regarding the methods employed in collecting and preparing the rubber shipped from Brazil, a subject which he has studied exhaustively, not only as regards the Amazona Valley, but in connection with Ceará and the other States further south as well. On this account we also regretted his absence from the Congress, and are sorry to notice that "in his absence" the Federal Government Commissioner has not contributed a paper to the valuable report of the Congress that Mr. Manders has published. We say this as no one can speak from a general point of view of Brazil, taken as a whole or as a rubber producing country, as Mr. Vasconcellos, who acted as her Commissioner in 1908, could have done. On this account, whoever else is sent to represent the Federal Government at New York, the Mecca of all good Pan-Americans, we hope that Mr. de Vasconcellos will be chosen.

A Libertação dos Centenarios da America do Sul.

PORQUE NÃO CELEBRAL-AS NA EXPOSIÇÃO DE BORRACHA EM NOVA YORK?

A America Latina, como todos sabem, está agora celebrando os centenarios das suas varias Republicas, isto é, de anno a anno um ou outro dos seus paizes, por meio d'uma Exposição ou outra celebração nacional, notifica a mundo que foi independente d'influencias externas desde ha cem annos.

Primeiro foi a Argentina, Chili a Mexico, agora a Venezuela, depois vem o Paraguay e as outras Republicas.

Desde 1810-11 uma atraz da outra das vinte e uma republicas, dispensaram do auxilio europeu e assignaram a declaração d'independencia.

S. Paulo por sua vez, está preparando para se celebrar por meio d'uma exposição internacional que terá logar em 1922, epocha do centenario da independencia do Brazil, pois foi nas bordas do Ypiranga, um pequeno ribeiro perto da cidade de S. Paulo (assim nos diz o *Bulletim Pan-Americano*) que D. Pedro I no dia 7 de Setembro de 1822 primeiro proclamou a independencia do Brazil.

Em congratulando as varias Republicas pelos seus rapidos e maravilhosos progressos que teem feito (despeito as guerras, disturbios locaes, falta de popularção e capital, e, no commenço um clima insalubre, a administração indifferente emquanto as opposições rivaes batalhavam para obter a sua superioridade) uma pessõá não pode deixar de reflectir o que os proximos cem annos terá de reserva com referencia ao seu commercio e desenvolvimento da sua agricultura.

Conforme já expõmos n'outro sitio, emquanto presenciamos durante o ultimo seculo as fundações e estabelecimentos d'estas Republicas Latinas, como importantes aneis que completaram a corrente das nações civilizadas que agora rodeam o mundo, se estas mesmas republicas continuarem a expandir-se e a prosperar da mesma forma, o futuro seculo virá observar a introducção e desenvolvimento dos seus vastos poderes d'agricultura, minas e commercio.

Por este motivo, não seria ella uma excellente ideia de aproveitar a Exposição Internacional de 1912 de Borracha em Nova York, na occasião de celebrar os centenarios unidos das Republicas Pan-Americanas, chemando a attenção das mesmas h'uma maneira effectiva como centros productores de borracha, não só da plantada como indigena.

Fosse isto feito, Pan-America, no mercado principal do seu commercio, poderia provar pelas variedades de borrachas que lhe pertencem e que pode apresentar, o que só ella é capaz de produzir.

Alli na cidade materna (deixando Philadelphia tomar segunda posição) os productores, poderiam convencer sem medo de renuncia os tantos compradores e frabricantes, das enormes vantagens das suas borrachas como materia prima.

Uma d'estas exposições unidas é que com grandes esforços tratamos de realizar para a Exhibição em Londres, e só fômos impedidos de levar a nossa intenção a uma acção bem succedida, pelo extremo trabalho e falta de qualquer corpo que s'organizasse para nos ajudar.

Na America porem a situação é muito differente.

Deixando os principaes centros productores incluir as suas exposições individuaes, conforme o Brazil, Mexico, Bolivia, etc., fizeran em Londres uma prominente exhibição combinada pela União Pan-Americana, debaixo da capavel directura do Illustre John Barrett, Sr. Francisco Yanes, o sub-director, e do Governador da União Pan-Americana em Washington, em conjunto com os Ministros d'Agricultura dos numerozos Estados que prefazem as varias Republicas, seia um efficiente reclame para sempre da borracha americana.

A collecção d'amostras assim formada poderia ser exposta n'um logar espaçozo, exactamente como o que foi reservado para as unidas exposições de Malaya, Ceylão, Sul da India, Colonias allemãs, etc., em Londres no Olympia em 1908 e Salão d'Agricultura este anno, para habilitar os productores, carregadores, compradores e fabricantes de s'encontrarem n'esse logar e ahi examinar e criticar as amostras, e insinuar qualquer aperfeiçoamento na sua qualidade de forma que torne o artigo mais apropriado para o fabrico a que se destina.

Tambem os representantes dos Governos, as possuidores das estradas ou plantações, etc., poderiam discutir entre elles ou com outros peritos, os difficeis assumptos bem como as melhores methodos de lancetar, coagulhar preparar e enfardar a borracha, se hevea, manihota, castilhoas, sapios, hancornias, etc., a questão dos direitos internos d'exportação, o melhoramento no transporte a reducção do custo do mesmo tanto no rio

como em terra aperfeiçoamentos para o serviço dos curtadores, e todos estes assumptos quetendem para a reducção do custo da sua producção e assim como habilitar os mercados do Sul d'America a competir com os do leste, tudo isto seria discutido se o Brazil, Bolivia e Peru tencionam desenvolver e tirar os melhores lucros das suas flrestas de borracha.

Em Londres or sr. Staines Manders generosamente offereceu põr um salão seprarado á disposição dos interessados da borracha brava, e sem duvida este senhor offerecerá o mesmo se possivel fõr para os productores Pan-Americanos em Nova York.

Em todo o caso, se as Republicas reservarem um logar para uma unida exposição merecedora de louvor, certamente terá de ser tão espaçoso como aquelle obtido pelo Brazil, o que pelo menos seria necessario para reservar logar para as amostras e admittir os varios representativos a se juntarem e poder discutir questões d'interesse commun.

Resta-nos esperar que esta ideia seja adoptada e um espaço n'estas condições seja obtido.

Em conclusão, accresentaremos, em vista da concurrencia do Oriente, que, apezar de amistosa, não deixa de ser verdadeira, séria e bem organisada, como productor de borracha, desejariamos ver o Governo Federal do Brazil fazer-se respresentar na Exposição e Conferencia que terão lugar em Nova York no mez de Setembro vindouro, por pessoa verdadeiramente competente, em condições de poder zelar pelos interesses de seo paiz e que soubesse fallar e escrever o idioma inglez.

Tendo-nos acostumado a lidar com o Sr. Hippolyto de Vasconcellos na Exposiçao e Conferencia do Olympia, em 1908, cujas habilitações sobre o assumpto em todos os seos detalhes são incontestaveis, muita falta d'elle sentimos na ultima Exposição, onde ninguem melhor que elle poderia representar o seo Governo, como já havia provado anteriormente. Além dos conhecimentos que tem o Sr. H. de Vasconcellos do assumpto que nos occupa, conhecimentos estes adquiridos no Amazonas e outros Estados do Brazil, a maneira perfeita por que se exprime e escreve o inglez, seria bastante para qualifical-o para o posto em que o esperamos ver em Nova York.

Em 1908 o Sr. H. de Vasconcellos era sempre encontrado no seo posto, onde attendia a todos que o interpellavam sobre a industria de borracha, respondendo com pericia ás questões as mais complexas; e o Brazil não pode dispensar os seos serviços em Nova York, a Mecca Americana, onde mais que em outra qualquer parte os interesses sul-americanos exigem competente representação.

In the Congo State Government Coffee plantations Liberian is being replaced by the indigenous *Coffea robusta*, which grows luxuriantly at Sankura. *Coffea robusta* flourishes also in the Dutch East Indies, and is being tried in South India.

Speaking at the second annual meeting of the Bandar Sumatra Rubber Co., on November 6th, the Chairman (Mr. Herbert Wright) reported a forward sale of some 500 piculs Robusta Coffee at 71s. 4d., a magnificent price for a crop that they regarded as insignificant.

(*Continued from page* 242.)

However, the neglect consequently suffered by the rubber plantation only served to establish the value of the tree selected for cultivation; for six years after, when "Our Friend" managed to obtain a re-transfer to his old post, the plantation was going strong, though entirely uncared for, and the saplings of 1902 had grown into splendid trees by 1908, yielding excellent rubber in paying quantities. Though European enterprise had done little to follow up the experiment, the lesson had not been lost upon the Chinese cultivators, and these busied themselves in laying out plantations wherever suitable land could be obtained.

During the interval, Colonel Wyllie had been employed in the Bombay Presidency and on the Goa frontier, and had not only laid out plantations of rubber in British but also in Portuguese India—the latter with the co-operation of two Portuguese officers. His advice to the Portuguese Government was embodied in a work published by Messrs. Higginbotham, of Madras, a copy of which he was privileged to present in person to the late King Carlos at Lisbon a year later. His Majesty thanked him warmly for the interest taken, and directed the Ministry of the Colonies to give the idea careful attention.

After his retirement, Colonel Wyllie returned to Portugal, contributing various articles on matters connected with tropical agriculture to the *Journal d'Agriculture Tropicale*, of Paris, the Lisbon *Dia and Reforma*, the Ceylon *Observer and Tropical Agriculturist*, and (after a visit to the Cape Verde Islands, S. Thomé, and Principé) publishing translations in English of several monographs by Portuguese writers, notably Senhor Monteiro de Mendonça's "Boa Entrada Plantations." He has also undertaken to combat what he considers to be mainly a campaign of defamation initiated by certain English writers against the labour system of the Portuguese Islands, the latest phase of which has been exposed in a work of Senhor F. Mantero, turned into English by "Our Friend" under the title "Portuguese Planters and British Humanitarians," published by the *Reforma*, a Lisbon Colonial journal (1911).

Colonel Wyllie now divides his time between Scotland as a summer residence and Mont'Estoril, on the Riviera of Portugal, where he is at present, as his winter quarters. Though no longer taking an active part in tropical agricultural enterprise, he retains his interest in the subject, and his numerous Portuguese friends continue to consult him upon points of difficulty where his advice may prove of service.

According to the *Indian Agriculturist*, the best way to manure coco-nut palms is to dig a trench half-way round the tree, about 9 in. in width and, say, 1 ft. in depth, close to the extremity of the roots. This trench may be left open for a short time, then the manure filled in, and the soil which has been excavated replaced. The following year the other half of the three is treated in a similar manner. As to manures, while cow dung and salt are strongly recommended, it is considered that it is best to use fish manure for coco-nuts, provided this can be obtained at a reasonable cost. In our November issue we discussed coco-nut manuring on p. 215, and the manufacture of fish guano on p. 224.

Cotton.

THE following were the prices for Cotton in London on December 8th, according to Messrs. Slann and Davies:—

	Good Fair.	Good.	Fine.	Superfine.	Compare Good 1910.	Compare Good 1909.	
	d. d.	d. d.	d. d.	d.	d. d.	d. d.	
Surat kinds* ...	$4\frac{9}{16}$ to $4\frac{3}{4}$	$4\frac{13}{16}$ to 5	$5\frac{1}{16}$ to $5\frac{5}{16}$	—	$6\frac{7}{8}$ to $7\frac{3}{8}$	$6\frac{3}{16}$ to 7	per lb.
Madras	$4\frac{7}{8}$ to 5	$4\frac{3}{4}$ to $5\frac{1}{4}$	—	—	$6\frac{15}{16}$ to $7\frac{5}{8}$	$6\frac{3}{16}$ to 7	—
Bengal	—	$4\frac{3}{8}$	$4\frac{5}{8}$	$4\frac{3}{4}$	$6\frac{1}{8}$	$5\frac{5}{8}$	—
Assam	—	$4\frac{5}{8}$	5	$5\frac{1}{2}$	$6\frac{3}{8}$	$5\frac{7}{8}$	—
China	—	$5\frac{1}{2}$	$6\frac{1}{4}$	$6\frac{1}{2}$	$6\frac{1}{4}$	$6\frac{3}{8}$	—
West Indian ...	$6\frac{1}{2}$	7	$7\frac{1}{2}$	$7\frac{3}{4}$	9	$7\frac{1}{4}$	—
Sea Island ...	$11\frac{1}{4}$	13	16	$18\frac{1}{2}$	18	12	—
West African ...	$4\frac{1}{2}$	$5\frac{1}{8}$	$5\frac{3}{8}$	—	$7\frac{7}{8}$	—	—
East ,, ...	$5\frac{3}{8}$	$6\frac{3}{16}$	$7\frac{7}{8}$	—	9	—	—

* Liverpool quotations.

There has been practically no change in the price of "Futures" this week (ending December 9th), but the quotation for "Middling" has been reduced from 5·13d. to 5·04d., being mostly the loss of the premium on the November position. The trade demand has shown some improvement, the sales reaching 59,000 bales. The crop movement continues quite free, but so does the distribution of it. East Indian is at present a fancy article, much above its comparative intrinsic value.

The import into Liverpool this week amounted to 150,046 bales, since September 1st 1,665,454, same week last year 148,740, last year's total 1,595,345 bales. The estimated Sales amounted to 59,000 bales, including "called." Middling American is quoted at 5·04d. per lb., last year 8·08d., 1909, 8·01d.

Movement of American Cotton since September 1st:—

	1911-12.	1910-11.	1909-10.
Brought into sight	7,110,000	6,209,000	5,882,000
Exports from United States since September 1st—			
To Great Britain	1,660,000	1,537,000	1,161,000
To Continent, &c.	2,027,000	1,559,000	1,902,000
Total crop	—	12,120,000	10,610,000

The latest quotations of Americans for delivery, basis Middling, any port, G.O.C.:—

	December 9th. d.	Last Week. d.	Last Year. d.
December	4·90½	4·91½	7·76
Dec.—Jan.	4·90	4·91	7·75½
Jan.—Feb.	4·91½	4·91½	7·76½

Coffee.

By MESSRS. C. M. and C. WOODHOUSE.

THERE is little change to report in the spot market during the past week, ending December 9th; prices have been rather irregular, but on the whole the tone is steady. The stocks in the principal ports of Europe on December 1st, according to Messrs. Düüring and Zoon, show an increase for the month of 290,000 bags, against a decrease of 160,000 bags in 1910, and the visible supplies on the same date show an increase of 298,000 bags, against a decrease of 85,000 bags at the same time last year. The market for "futures" opened firm and rather dearer, but on lower quotations from Brazil a weak tone prevailed and values dropped appreciably; a further decline took place on lower advices from the Continent and New York, and, although there was a little recovery at the close, the latest price of March Santos is 1s. per cwt. lower for the week. We quote:—

		To-day.	Nov. 30th, 1911.
London ..	Santos, Mar. del.	60s. 6d.	61s. 6d.
New York ..	No. 7 Rio ,,	13.19 cents.	13.59 cents.
Hamburg ..	Santos ,,	66¾ pf.	68¼ pf.
Havre ..	Santos ,,	80½ fcs.	83¼ fcs.

The receipts at Rio and Santos from July 1st to December 6th, 1911, were 9,141,000 bags, against 8,288,000 and 12,184,000 bags in 1910 and 1909 respectively. Sales include:—

Costa Rica.—620 bags, at 75s. to 76s. for smalls, 78s. 6d. to 83s. 6d. for low middling to good middling, 82s. to 92s. for middling to fine bold.

Guatemala.—450 bags, partly new crop, at 75s. for smalls, 78s. to 81s. for middling to good middling, 81s. 6d. to 85s. for bold.

Mexican.—290 bags, at 81s. 6d. to 82s. for good middling, 83s. 6d. for bold.

Ecuador.—11 bags, at 68s. for good ordinary palish.

Colombian, &c.—360 bags, at 74s. to 79s. for smalls, 77s. to 81s. 6d. for fine ordinary to good middling, 81s. to 86s. 6d. for bold.

Dumont Santos.—2,400 bags, at 69s. to 72s. 6d. for smalls, 70s. to 73s. for middling, 72s. 9d. to 74s. 6d. for bold.

The India-rubber Market.

By MESSRS. S. FIGGIS AND CO.

THE largest quantity (529 tons) yet offered was up for sale on November 28th—30th. Before the sale, fine hard Pará was firmer at 4s. 4d., and there was an excellent demand for Plantation, except for Smoked Sheet, which was plentiful and 1½d. per lb. below last auctions, whilst prices of Crêpe ran about last sale's closing rates. Practically the whole 529

tons catalogued were sold at about the prices of last fortnight's auctions (except the Smoked Sheet). Dark and good brown crêpe realized higher prices. On November 30th fine hard Pará was selling firmer at 4s. 4d. to 4s. 4½d.

Sales on November 28th—30th included:—

Plantation Malay (446 tons all sold).—Sheets, fair to fine smoked, 4s. 8¼d. to 4s. 9¾d.; damp and part smoked, &c., 4s. 5d. to 4s. 8d.; fair to fine unsmoked, 4s. 7¾d. to 4s. 9¼d.; damp, mouldy and stuck (one lot 4s. 1½d.), 4s. 3¾d. to 4s. 7¾d.; block, fine pale Lanadron, 4s. 9¾d.; crêpe, fair to fine pale, dull to good palish, 4s. 8¼d. to 4s. 10d.; light brown and grey, part streaky, 4s. 7d. to 4s. 9d.; clean brown, 4s. 5d. to 4s. 8¼d.; dark brown, part specky, 4s. 3d. to 4s. 7d.; black and soft, part pressed, 3s. 9¾d. to 4s. 5½d.; black and soft, very inferior, 2s. 6¾d. to 3s. 4¼d.; smoked, 4s. 0½d. to 4s. 9d.; scrap and virgin, fair to fine, 3s. 9½d. to 4s. 0¾d.; mixed and inferior, 2s. 11d. to 3s. 7d.; Rambong, good Crêpe, 4s. 3d.; good block and scrap, 4s. to 4s. 1¾d.; Castilloa, pressed sheet and block, 3s. 10d. to 4s. 1¾d.; inferior sheet and block, 2s. 6d. to 3s. 4d.

Ceylon (83 tons all sold).—Sheets, fair to good smoked, 4s. 8½d. to 4s. 8¾d.; sheets and biscuits, fair to good unsmoked, 4s. 7¼d. to 4s. 8d.; damp and stuck unsmoked, 4s. 2¼d. to 4s. 6d.; Ceará, 4s. 5½d. to 4s. 6¼d.; crêpe, thick fair to fine, 4s. 8½d. to 4s. 10d.; fair to fine pale, dull to good palish, 4s. 8¼d. to 4s. 10d.; clean and light brown, 4s. 5½d. to 4s. 9d.; dark and specky brown, 4s. 2¼d. to 4s. 6d.; black and soft, part pressed, 3s. 7½d. to 4s. 3½d.; smoked, 4s. 6½d. to 4s. 8½d.; scrap and cuttings, fair to fine, 3s. 10d. to 4s. 2½d.; mixed and inferior, 3s. 3½d. to 3s. 7d.

Manihot.—Good brown thick crêpe sold at 4s. 2d. to 4s. 2¼d.

C. American, Colombian, &c., if good quality, sells firmly. Fair brown scrap realized 3s. 5½d.; Colombian brown and white scrap, 3s. 3d.

Mozambique, Zanzibar, and Manihot.—Clean hard red in active demand at very high prices. Fine clean red ball and sausage, 3s. 11d. to 4s. 1d.; mixed and sandy, 2s. to 3s.; mixed Lamu ball, 2s. 9d.; heated Ibo ball, 2s. 3d. to 2s. 4d.; Manihot small pats and crêpe, 3s. 6d.; Lewa ball, 2s. 11¼d.

Malaysian was in very good demand at higher prices, and sold, good brown and dark crêpe, at 3s. 5¼d. to 3s. 5½d.

At the sales on December 12th to 14th there was an active demand for all Plantation grades and prices were about 3d. per lb. above rates quoted above, with hard fine Pará at 4s. 5½d. Prices realized were:—

Plantation Malay (353 tons all sold).—Sheets, fair to fine smoked, 4s. 11¼d. to 5s. 2¼d.; damp and part smoked, 4s. 9½d. to 5s.; fair to fine unsmoked, 4s. 11½d. to 5s. 1¼d.; damp, mouldy and stuck, 4s. 7¾d. to 4s. 11d.; block, fine pale Lanadron, 5s. 3d.; crêpe, fair to fine pale, dull to good palish, 4s. 11¾d. to 5s. 2d.; light brown and grey, part streaky, 4s. 10½d. to 5s. 1½d.; good clean brown, 4s. 8d. to 5s. 1d.; dark brown, part specky, 4s. 7d. to 4s. 10½d.; black and soft, part pressed, 3s. 11½d. to 4s. 7d.; black and soft, pressed, very inferior, 3s. to 3s. 10d.; smoked, 4s. 7¾d. to 5s. 1¼d.; scrap and virgin, fair to fine, 3s. 11¼d. to 4s. 4¼d.; mixed and inferior, 2s. 4½d. to 3s. 4d.; Rambong, good crêpe, 4s. 0¼d. to 4s. 6d.; block and scrap, 3s. 11½d. to 4s. 3½d.; Castilloa, pressed sheet and block, 4s. 1¾d. to 4s. 3¼d.; very soft sheet, 2s. 9d. to 3s. 8d.

Ceylon (116 tons all sold).—Sheets, fair to good smoked, 5s. to 5s. 2d.; sheets and biscuits, fair to fine unsmoked, 4s. 11d. to 5s. 1½d.; damp, mouldy and stuck, 4s. 8d. to 4s. 11d.; good Ceará, 4s. 10d. to 4s. 11¼d.; crêpe, thick, fair to fine, 5s. 0¾d. to 5s. 2¼d.; fair to fine pale, dull to good palish, 4s. 11¾d. to 5s. 2d.; clean and light brown, 4s. 9d. to 5s. 1d.; dark and specky brown, 4s. 8d. to 4s. 10d.; black and soft, part pressed, 4s. 0¼d. to 4s. 9¾d.; smoked, 4s. 9d. to 4s. 11¼d.; scrap and cuttings, fair to fine, 3s. 11¼d. to 4s. 3¼d.; mixed and inferior, 2s. 6d. to 3s. 4¼d.

Manihot (2 tons, part sold at good prices).—Crêpe, good brown, 4s. 4½d. to 4s. 5¾d.

Brazil.—Ceará (2¾ tons sold well); crêpe, light brown pressed, 4s. 4d. to 4s. 5½d.

Mangabeira.—Fairish thin sheets, 3s.

Mozambique and Nyassa are in demand and sell well, including good brown Manihot, crêpe, 3s. 11d. to 3s. 11¼d.; Lewa ball and pats, 3s. 1½d. to 3s. 3d.; reddish Beira ball, 3s. 5¾d. to 3s. 10½d.; small Ibo ball, 3s. 2¼d.; pressed reddish strips, 3s. 4¼d.; soft reddish Nyassaland slab, 2s. 8¼d. to 3s.

Abyssinian sold well, say, fair thin sheets, 3s. 3d. to 3s. 3½d.

Pará rubber crop statistics for the month of November (tons):—

	Pará.	Caucho.	1911.	1910.	1909.	1908.
Receipts at Pará ..	3,280	260 =	3,540 agst	3,790	4,640	3,430
Shipments to Europe	2,110	200 =	2,310 ,,	2,400	1,790	1,560
,, America	1,610	70 =	1,680 ,,	1,170	1,670	1,920

Crop statistics, June 30th, 1911, to November 30th, 1911 (5 months):—

		Pará.	Caucho.	1911.	1910.	1909.	1908.	1907.
Pará Receipts	1911	11,020	1,160	12,180	13,140	13,200	12,450	11,680
	1910	11,130	2,010					
,, Shipts., Europe		5,720	1,130	6,850	6,890	6,240	6,250	6,610
,, ,, America		6,300	490	6,790	5,510	5,900	6,130	4,650

Messrs. Zorn and Leigh-Hunt, writing at the end of November on the improved tone of the Rubber Share Market, reported that this improvement tended to become more marked with an increasing amount of good-class investment buying. Shares of the type which are at present wanted by buyers seem to be in decidedly small supply at current prices, and as dealers are naturally very shy of selling such shares "short," quotations have in a large number of cases advanced during the week. The November rubber outputs are highly satisfactory, and indicate that many companies will show much better total crop returns for the year 1911 than had at one time been anticipated. The price of the raw material is very firm, with a gradually hardening tendency, and encouraging "forward" sales for 1912 continue to be made by various companies. One such sale was effected on December 5th as high as 4s. 8d. per lb. During the week ending December 13th the volume of business was greater than for a long time past.

Sugar.

THE leading question under discussion in the sugar market, wrote Mr. C. Czarnikow, is still the Russian

proposal that was submitted in Brussels on December 8th, and on which the German Trade were consulted. Russia demands total exports 500,000 tons in 1911-1912, and a cumulative contingent of 20 per cent. of its yearly production in 1912-1917, with a further 100,000 tons added whenever prices during any fortnight are maintained above 15s. The German Delegates are supposed to have unanimously voted the rejection of these terms, and the German Government may wish to postpone a decision till after the January elections. Russia increased her stocks last season by 450,000 tons (previous stocks were almost exhausted), and she produces this year 150,000 tons less, consuming probably more. She has officially estimated her exportable Convention quantity (excluding necessary reserve stocks) at 500,000 tons, including old stocks, but many people already see the double of it. This evidently is a regrettable state to be in. A settlement at Brussels meeting seems doubtful, and the market for May moved from 16s. 4½d. to 16s. 7½d. to 16s. 3¾d. to 16s. 8¼d., though New York declined from 5.06 to 4.94 cents, and imports in United Kingdom were on a very large scale.

America is not likely to trouble us any more, and some people believe that New York will make an effort to drive Cubans to Europe, in order to depress our market. It remains to be seen whether the Cuban planter has any say in the matter. A correspondent of the *Times* estimates that crop before the late beneficent shower at 1,800,000 tons, and thinks that shower added another 200,000 tons. If we were to have some half-dozen more of those showers, the situation might become quite alarming! We have had no estimates over 1,800,000 tons after the rain, but we had lower figures before.

The American market has been quiet, and the spot quotation for Centrifugals relapsed from 5.06 to 4.94 cents=15s. c.i.f. for 96 per cent. Javas. In Cuba Centrifugals business has been done for first half January shipment at 4.73 cents. The landings in the three ports for the week were 23,000 tons, and meltings 22,000 tons, leaving stocks at 134,000 tons.

In the United Kingdom business in Cane Sugar has been upon a most limited scale, refiners keeping almost entirely out of the market. Grocery Crystallised at auction sold at generally steady rates, fine qualities being rather dearer.

From Cane-producing countries there is no special feature. The weather in Cuba remains favourable.

The total transactions of British West India for the week ending December 9th amounted to about 3,500 bags. Crystallised Demerara, middling to good middling greyish and yellow sold at 20s. 10½d. to 21s. 6d. duty paid, good bright yellow 22s., fine palish 22s. 4½d., fine bright yellow 23s., very fine pale yellow 23s. 9d.; syrups, good strong brownish 17s., good middling soft yellow and palish 18s.

One hundred and eighty bags greyish crystallised Penang offered at auction sold at 17s. to 18s. duty paid.

One thousand two hundred and eighty bags crystallised Surinam sold, middling yellow to good middling yellow realised 20s. 9d. to 21s. 3d. duty paid.

In Liverpool, about 3,000 bags Peruvian syrups have been sold at 13s. 6d. quay terms, telquel, and 13s. floating, landing, Clyde, basis 89 per cent.

Tea.

By Messrs. Wm. Jas. and Hy. Thompson.

During the week ending December 9th the usual official summary of outturn and prospects in Northern India has come to hand. It discloses the fact that November yields have in most cases been disappointing throughout the producing districts, and the manufacturing season may now be regarded as definitely closed. Total exports to the United Kingdom were about 11 million lb. ahead of last year at the end of November, and the ensuing few months may, for the above reasons, reveal some shrinkage in this excess; at the same time it should be realised that much of the increase in the crop is destined for this market, though it may not be fully reflected at public auctions.

Recent information from China confirms reports of the adverse effects on the Green tea trade with America, resulting from rigorously enforced legislation in respect of the admission of "faced" teas into that country. Shanghai exports of Green tea have fallen off about 8 to 9 million lb., and it is noteworthy that coincidently an increase in the exports of Black leaf kinds to the United States has occurred. It is reported in some quarters that a modification of the new law in the United States is probable, and the Eastern markets have to some extent responded. The effect of this suspension of the American demand, however, has apparently been reflected in a material increase in trade with Central Asian outlets.

Offerings during the week of both Indian and Ceylon growths have been moderate, and the market has assumed a steady tone with good general buying at the lower level previously established. The feature during the week has been the narrowing of prices for all teas at and under 8½d., indicating an increasing tendency towards a consideration of price rather than of grade or quality. The sales have chiefly consisted of ordinary medium kinds, and no improvement has been visible.

With Indian teas the sales passed off with good spirit; brisk competition was extended to tea generally, and although no quotable change in prices can be recorded, the tone was distinctly firmer. The market may be regarded as fully steady on last week's level of value, the only exception being a slight irregularity in the case of Broken Pekoes, between 9d. and 1s. per lb. The highest averages from the various districts were: Darjeeling—Goomtee, 1s.; Seeyok, 11¾d.; Turzum, 11d.; Ambootia and Phoobsering, 10½d. Assam—Beheating, 1s. 0½d.; Rupai Co., 1s.; Muttrapore, 11¼d.; Subansiri and Bordubi, 10¾d.; Lengri and Limbuguri, 10½d. The result of the whole sale on Estate Account was 9d. per lb. compared with 8½d. per lb. a year ago.

Following the tone of the Indian market, prices for Ceylon were fully firm up to 9d.—9¼d. Quality is showing a certain amount of variation, some medium grade teas being rather better than last invoices. Tea for price and low Pekoes sold at last week's rates, though in some cases the teas were rather inferior. Brokens from 8¾d. to 9¼d. were a strong market, and here and there made advances of ¼d. Over 10d. there was perhaps rather less competition, and sellers

occasionally had to accept slight reductions. Dusts and Fannings were steady to firm. The highest averages were: Goatfell, 11½d.; Cranley, Brookside, 11d.; West Fassifern, Kenmare, Henfold, 10½d. For the whole sale on Estate Account the average price was 9¼d. per lb., against 9⅜d. per lb. last year.

With Chinas, common descriptions have been in less request than of late, and but few contracts are reported. Some of the better kinds have been taken for export.

The demand for Javas was good, and all grades were well supported at fully last sale rates. The best averages being: Goalpara, 10 5-6d. and Tanawattee 10¼d. For the whole sale on Garden Account the result was 8⅝d. per lb., contrasted with 8⅜d. a year ago.

The London Cocoa Market.

By The Editor.

At the time of supplying the first part of this report, previous to the sales of December 12th, we have had no auctions for a fortnight, that is, since November 21st, so it is difficult to say exactly how the market stands. At the close I will give the latest information obtainable up to December 15th, when we go to press, and that will show exactly how we stand as to values. Meanwhile, we hear no more news of the valorization scheme, but note that superior Bahias were sold at 59s. in London. This price seems very low in comparison to Grenadas, which, in the absence of any sales, are valued at over 60s., for it must be remembered that at the end of October one of the two best Bahian marks sold at 63s. 6d., against 62s. 6d. as the top price at the time for Grenadas, and that for only one lot. Allowing that the usual run of superior Bahias are 1s. below these picked marks, then Bahias to-day should still sell at fine Grenada valuations (60s. to 61s.), unless, of course, the coming sales show Grenadas to be only worth 58s. to 59s. Meanwhile, whilst Bahias are valued at 55s. to 59s., San Thomé and Cameroons are put at 59s. to 61s., and Grenadas up to 61s. 6d. Whether these are nominal valuations or not, they still show the comparative values put upon each growth by the market. Havre, as can be seen later on, valued Bahias at the end of March at Fcs. 67-76, against San Thomé, Fcs. 72-75, and Grenadas up to Fcs. 75.

Meanwhile, one cannot help noting the large output from Bahia this year, and wondering where the cocoa is. London, with her 266 bags (on December 2nd), has not got them, at least visible; neither has Havre, which, at the end of November, had only 14,056 bags in stock, against 24,304 bags last year. Against this, the Bahia receipts from January-October are returned as being 439,515 bags (against 293,300 bags last year), and the bulk of these were exported. Someone therefore has substantial stocks of Bahia stowed away out of sight, and so are in no hurry to buy more; hence probably the cause of the low price of the sale reported, buyers being unwilling to operate.

Taking the market as a whole, it is quiet, and tends lower, although with receding stocks, except at Lisbon. Prices remain good from the producers' point of view, taking all things into consideration, though no doubt a higher level is still asked for. Lisbon returns, according to Messrs. Martin Weinstein and Co., show 18,000 bags more in stock than at the end of October, as follows:—

Stock at Lisbon, October 31st	51,375	bags
Arrivals ,, in November	42,891	,,
Makes ...	94,266	,,
Delivered in November ...	24,901	,,
Leaves Stock, November 30th	69,365	,,
Against ,, November 30th, 1910 ...	118,787	,,

The Havre figures at the end of November stood as under. As I feel it may be of more interest and use, I give the comparative stock at the end of May only, instead of last year, to show how Havre has reduced her total by just upon 100,000 bags in the six months, say:—

Havre Stock—	Nov. 30, 1911. Bags.	Value 30.11.11 Fcs.	Value 30.11.10 Fcs.	May 31st, 1911. Bags.
Pará	19,997	74 to 76	66 to 69	14,408
Bahia	14,056	67 ,, 76	62 ,, 68	37,930
Venezuela	53,435	72 ,, 200	67 ,, 175	41,459
Trinidad	35,907	74 ,, 74	67 ,, 70	50,070
Grenada and other W.I. ...	2,561	69 ,, 75	63 ,, 68	5,991
San Thomé ...	14,290	72 ,, 75	64 ,, 65	27,265
San Domingo ...	6,719	65 ,, 70	60 ,, 63	4,961
Haiti	2,696	58 ,, 71	51 ,, 64	16,565
Accra	30,212	65 ,, 67	59 ,, 62	58,794
Guayaquil	13,182	71 ,, 79	70 ,, 83	15,168
Others	7,940	—	—	27,615
Total ...	200,995			300,226
In 1910 ...	241,828			240,674

London Stock, December 9th—	1911. Bags.	1910. Bags.
Trinidads	4,816	7,399
Grenadas	5,851	9,250
Other W.I.	5,341	3,666
British West Africa ...	6,735	2,396
Portuguese West Africa ...	2,331	2,992
German West Africa ...	4,690	1,564
Ceylon and Java	10,965	8,689
Guayaquil	41,845	34,475
Brazil and Bahia	226	409
Other Foreign	7,681	12,331
Totals ...	90,481	83,171

Coming to the matter of consumption, I have worked out the following:—

	1911.	1910.	1909.
Germany (10 months) ...	41,338	35,411	33,413 tons
France 10 ,, ...	21,752	19,964	18,611 ,,
U.K. 10 ,, ...	20,549	18,726	20,048 ,,
Holland 10 ,, ...	19,774	15,691	16,118 ,,
U.S.A. 9 ,, ...	49,390	38,132	42,048 ,,
Comparative totals	152,803	127,924	130,238 ,,

As regards the United Kingdom, the Board of Trade figures for November only show a falling-off of over 400 tons in the deliveries for home consumption (1,843 against 2,288 last year). The exports, however, show a comparatively substantial increase (681 tons, against 469 last year), which is worth noting as showing the

state of the demand elsewhere. The figures for the eleven months work out as under:—

Raw cocoa only—	Landed.	Del'd. H.C.	Export.	Stock (Nov. 30th)
Jan.-Nov., 1909—	31,339	22,453	6,038	7,755 tons
,, ,, 1910—	27,085	21,014	6,193	8,358 ,,
,, ,, 1911—	29,367	22,392	6,275	10,165 ,,
Increases	2,282	1,378	82	1,807 ,,

As the year is almost at an end, it is good to realize the exceptionally large extent of the Guayaquil receipts, following on the bumper crop of 1910. To mid-December, *i.e.*, fourteen days only short of the full year, they were 799,700 qtls., against 713,400 qtls. in 1910 (the previous record), 605,400 qtls. in 1909, and 603,300 qtls. in 1908.

Coming to the matter of London prices, these ran as follows, previous to the sales on December 12th, when Grenadas realized only 58s. for fine marks, against the following pre-sale rates:—

Trinidads.—Fine marks sold at 66s. to 67s., superior are nominally valued up to 70s.; mid. to good mid. red sold at 62s. 6d. to 65s. 6d.

Grenadas have been scarce. At the end of November fine were selling up to 62s. and even 62s. 6d.

Jamaicas have been selling at 59s. 6d. to 61s. for the best marks.

Dominicas.—Fine sold up to 61s., ordinary unfermented down to 57s.

Montserrat.—Fair reddish sold at 66s. 6d.

Bahia.—Superior last sold at 59s. Fair fermented is valued at 55s. or 56s.

British West African was valued in London at 49s. to 55s. Up at Liverpool they have been selling freely at 45s. or 46s. up to 54s.

German and Portuguese West African are valued at 59s. to 61s.

Samana and Sanchez are worth about 54s. to 56s. for fair.

Ceylons have been conspicuous by their continued absence. Lacking any business, I would quote fine as being worth 80s. and over, and fair to good medium and bold 65s. to 75s.

Guayaquils accumulate but do not sell freely. A parcel of Caraquez changed hands at 59s. for good reddish, whilst Arriba is worth 60s. and up.

At the sales on December 12th fine Grenadas fell to 58s., and now 57s. is spoken of as the highest bid. Fair to good red sold at 55s. to 57s.; common unfermented down to 54s. Trinidads remain firm, and this is not to be wondered at, considering only 289 bags left that island for England between October 1st and November 27th, during which period over 1,600 bags were exported from London alone to elsewhere where the cocoa is wanted. Guayaquils were considered to be 3s. lower, some rather mixed Machala only realizing 54s. 6d. to 55s. 6d. Good reddish Costa Rica had only 55s. bid at the sales, and have since been sold at this price. The sales dragged, as out of a total of over 5,000 bags offered (2,262 being Grenadas) only about 1,000 bags sold, including 650 Grenadas. For St. Lucias 57s. was bid and refused for the best. Some nice lots of San Thomé were withdrawn at 60s., but this does not say what their actual value is. Liverpool is quiet and easier.

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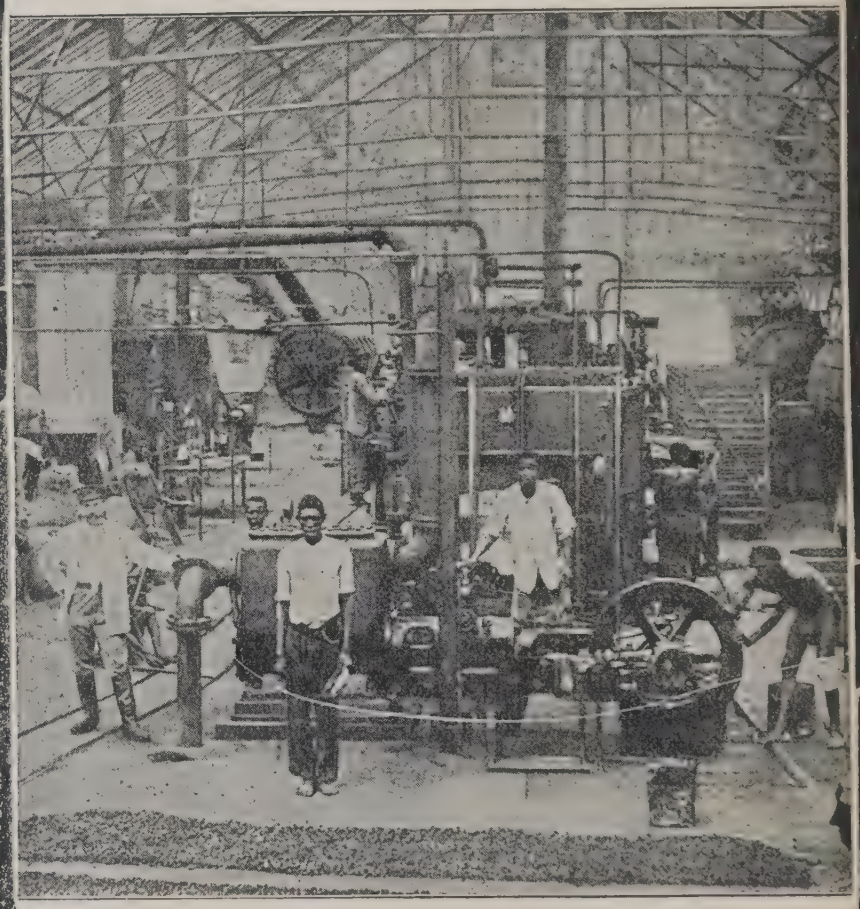

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